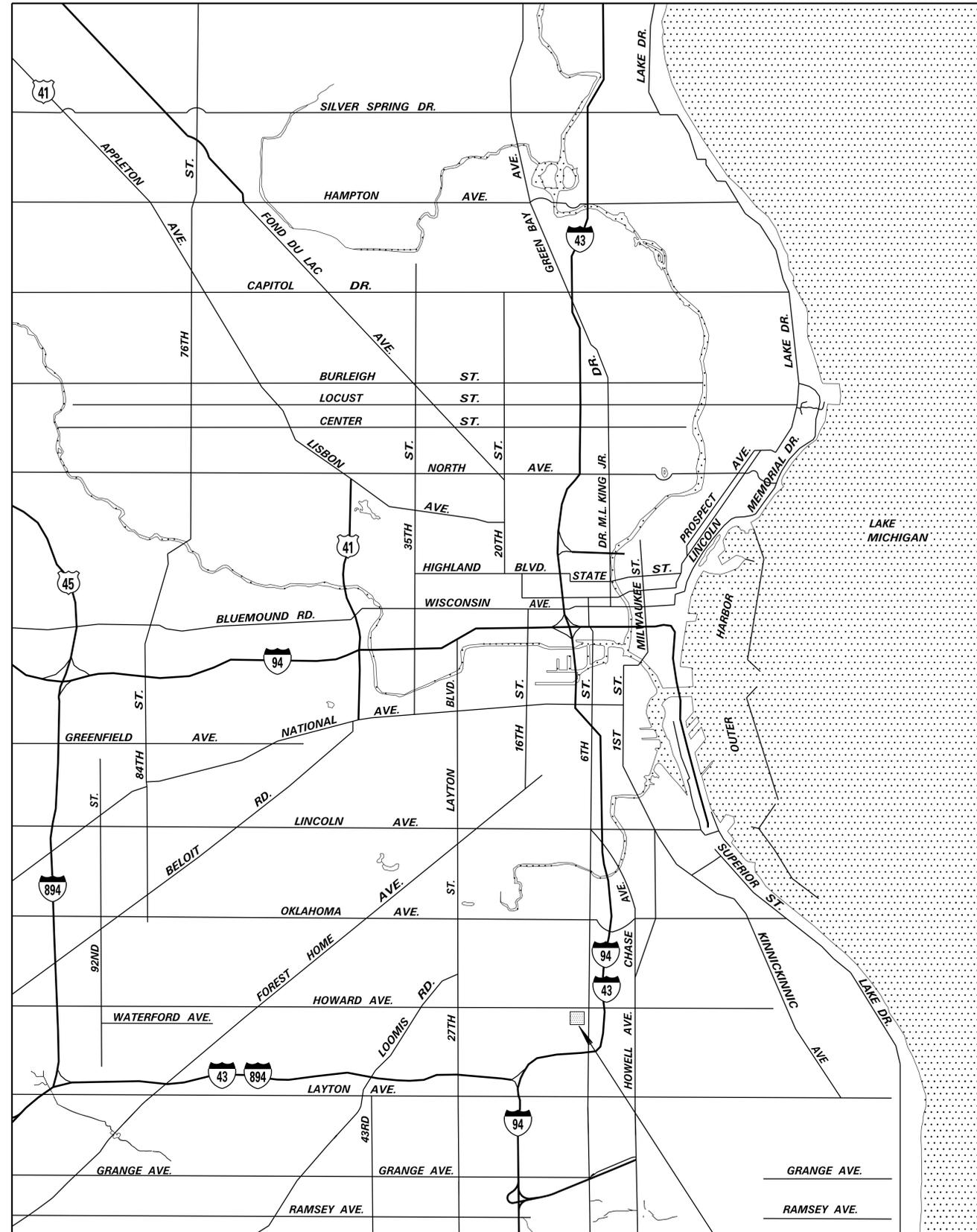


Milwaukee Water Works

WATER PURIFICATION PLANT

HP-179 ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS



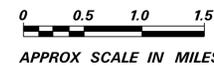
MILWAUKEE, WISCONSIN

LOCATION MAP

HOWARD AVENUE PURIFICATION PLANT - PROJECT LOCATION

DRAWING INDEX

DRAWING NO.	TITLE
CONTRACT DRAWINGS	
HP-179-01	LOCATION MAP & DRAWING INDEX
HP-179-02	BASEMENT PLAN - DEMOLITION
HP-179-03	GROUND FLOOR PLAN - DEMOLITION
HP-179-04	SECOND FLOOR PLAN - DEMOLITION
HP-179-05	ROOF PLAN - DEMOLITION
HP-179-06	BASEMENT PLAN - HVAC
HP-179-07	GROUND FLOOR PLAN - HVAC PIPING
HP-179-08	SECOND FLOOR PLAN - HVAC PIPING
HP-179-09	GROUND FLOOR PLAN - HVAC DUCTWORK
HP-179-10	SECOND FLOOR PLAN - HVAC DUCTWORK
HP-179-11	ROOF PLAN - HVAC
HP-179-12	SCHEDULES - HVAC
HP-179-13	HVAC CONTROLS
HP-179-14	HVAC CONTROLS
HP-179-15	DRAWING VOIDED
HP-179-16	GROUND FLOOR - ARCHITECTURAL CEILING PLAN
HP-179-17	SECOND FLOOR - ARCHITECTURAL CEILING PLAN
HP-179-18	GROUND FLOOR PLAN - FIRE ALARM
HP-179-19	SECOND FLOOR PLAN - FIRE ALARM
HP-179-20	SITE PLAN - FIRE ALARM
HP-179-21	SYMBOLS & ABBREVIATIONS - ELECTRICAL / LIGHTING
HP-179-22	GROUND FLOOR PLAN - LIGHTING
HP-179-23	SECOND FLOOR PLAN - LIGHTING
HP-179-24	BASEMENT FLOOR PLAN - ELECTRICAL
HP-179-25	GROUND FLOOR PLAN - ELECTRICAL
HP-179-26	SECOND FLOOR PLAN - ELECTRICAL
HP-179-27	ROOF PLAN - ELECTRICAL
HP-179-28	SCHEMATICS - ELECTRICAL
HP-179-29	SCHEDULES - ELECTRICAL



NO.	BY	REVISION	DATE

Milwaukee Water Works Department of Public Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
LOCATION MAP & DRAWING INDEX			
DESIGNED BY	M.A.G.	DATE	9-25-12
DRAWN BY	J.F.S.	PLANTS PROJECT ENGINEER	
CHECKED BY	A.J.S.	DATE	9-25-12
SCALE	AS SHOWN	DATE	9-25-12
WORK ORDER	WT450093300	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
OFFICIAL NOTICE	56-2012		
FILE NO.	B-12-2		
			DRAWING NO. HP-179-01

DEMOLITION NOTES - GENERAL

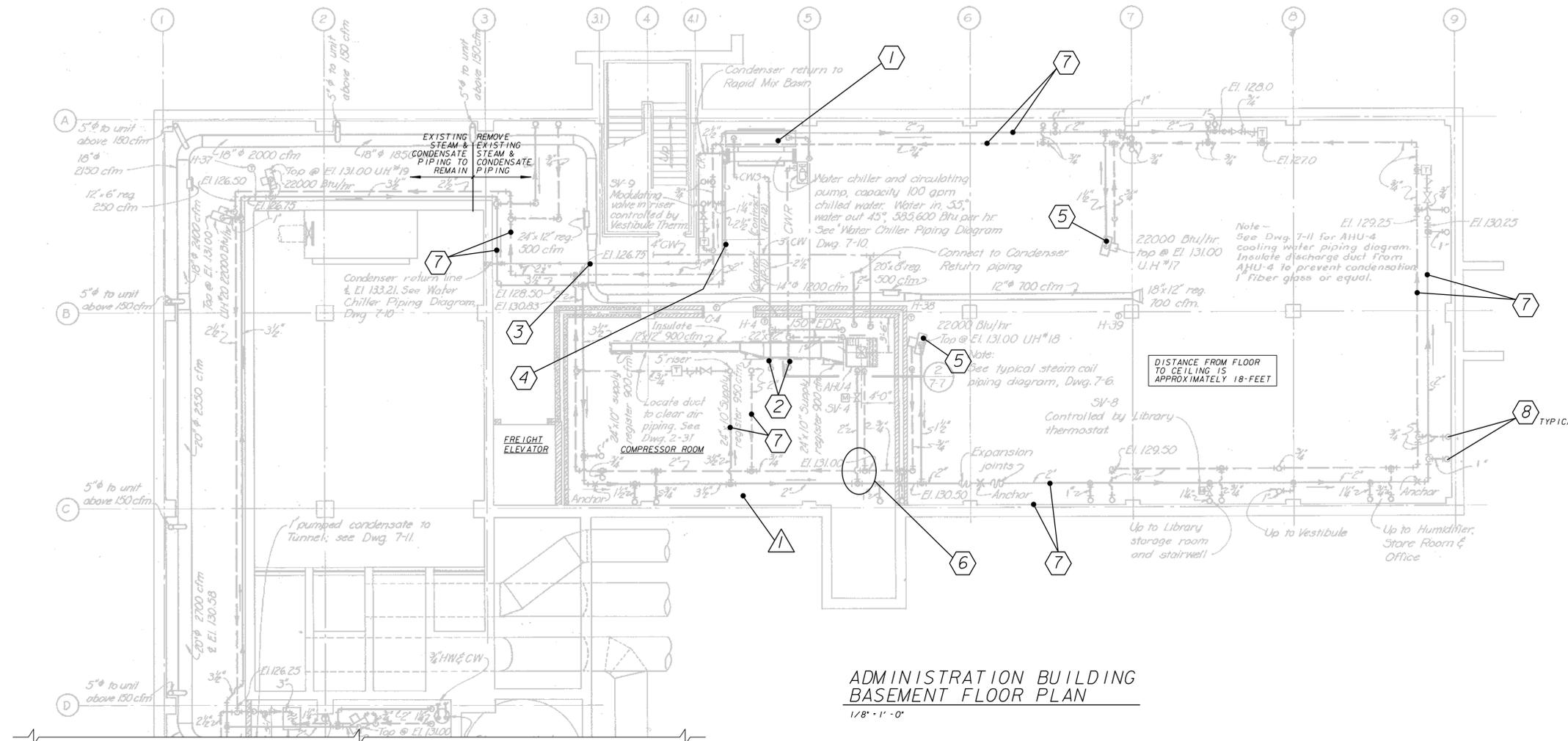
1. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL DEMOLISHED EQUIPMENT AND MATERIAL OFF-SITE UNLESS OTHERWISE SPECIFIED.
2. FREIGHT ELEVATOR'S INTERIOR DIMENSIONS ARE APPROXIMATELY 5' - 6" x 8' - 0". ELEVATOR'S MAXIMUM CAPACITY IS 5,000 POUNDS.
3. CONTRACTOR IS RESPONSIBLE FOR PROTECTING EQUIPMENT AND FURNISHINGS FROM DUST AND PHYSICAL DAMAGE WHILE CEILINGS ARE BEING DEMOLISHED. CONTRACTOR SHALL PROVIDE TEMPORARY PROTECTION FOR EQUIPMENT AND FURNISHINGS THAT ARE PERMANENTLY INSTALLED. CONTRACTOR SHALL PROVIDE A MINIMUM 48-HOURS NOTICE PRIOR TO DEMOLISHING A SPACE'S CEILING. CONTRACTOR HAS THE OPTION OF RELOCATING MOVEABLE EQUIPMENT AND FURNISHINGS TO ANOTHER AREA OR PROVIDING TEMPORARY PROTECTION FOR SAID EQUIPMENT AND FURNISHINGS.
4. CONTRACTOR SHALL REMOVE ALL DEBRIS AND DUST THAT WAS A RESULT OF CEILING DEMOLITION. WALLS, FLOORS AND EQUIPMENT SHALL BE VACUUMED AND WIPED DOWN WITH A CLEANING SOLUTION.

DEMOLITION NOTES - ARCHITECTURAL

- 1 REMOVE SUSPENDED METAL LATH AND PLASTER CEILING FROM COMPRESSOR ROOM. REMOVE CEILING SUPPORTS.

DEMOLITION NOTES - HVAC

- 1 REMOVE WATER CHILLER, CIRCULATING PUMP, PIPING AND ASSOCIATED ACCESSORIES. REMOVE PIPE SUPPORTS.
- 2 REMOVE CWS AND CWR PIPING FROM WATER CHILLER TO AHU'S COOLING COILS. AHU'S ARE LOCATED IN THE SECOND FLOOR MECHANICAL ROOM.
- 3 REMOVE CR PIPING FROM WATER CHILLER TO RAPID MIX BASIN.
- 4 REMOVE C PIPING FROM WATER CHILLER TO 4-INCH MAIN.
- 5 REMOVE UNIT HEATER, STEAM BRANCH PIPING, CONDENSATE BRANCH PIPING, AND ASSOCIATED ACCESSORIES. REMOVE PIPE AND UNIT HEATER SUPPORTS.
- 6 PIPING TO AND FROM AHU-4 SHALL REMAIN.
- 7 REMOVE STEAM MAIN PIPING, CONDENSATE MAIN PIPING, AND ASSOCIATED ACCESSORIES. REMOVE PIPE SUPPORTS.
- 8 REMOVE STEAM BRANCH PIPING AND CONDENSATE BRANCH PIPING TO CONNECTORS. REMOVE ASSOCIATED ACCESSORIES. REMOVE PIPE SUPPORTS. ALL CONNECTORS IN ADMINISTRATION BUILDING SHALL BE REMOVED.



**ADMINISTRATION BUILDING
BASEMENT FLOOR PLAN**
1/8" = 1' - 0"

LEGEND

	GLOBE OR FLOW CONTROL VALVE		VACUUM BREAKER		LOW PRESSURE STEAM LINE* ARROW IN LINE, DIRECTION OF FLOW* ARROW ABOVE LINE, DIRECTION OF PIPE LINE PITCH.
	GATE VALVE		CAP		CONDENSATE LINE* ARROW IN LINE, DIRECTION OF PIPE LINE PITCH.
	AUTOMATIC CONTROL VALVE		FLOW DIRECTION		FLOAT AND THERMOSTATIC STEAM TRAP
	AUTOMATIC 3-WAY VALVE		CONDENSER WATER SUPPLY		THERMOSTATIC STEAM TRAP
	CHECK VALVE		CONDENSER WATER RETURN		EXPANSION JOINT
	Y STRAINER		CHILLED WATER SUPPLY		PIPE ANCHOR
	FLEXIBLE CONNECTION		CHILLED WATER RETURN		INCLUDED RISE (R) OR DROP (D)
	PRESSURE OR VACUUM GAUGE		UNION		ABBREVIATION SCHEDULE NUMBER
	PRESSURE RELIEF VALVE		PIPE DOWN		
	FLOW SWITCH		PIPE UP		
	THERMOMETER		PUMP		
	AIR VENT		ROOM THERMOSTAT		
			STATIC PRESSURE SENSOR		

ABBREVIATIONS

AHU	AIR HANDLING UNIT	C	STEAM CONNECTOR UNIT
CWS	CHILLED WATER SUPPLY	PV	POWERED VENTILATOR
CWR	CHILLED WATER RETURN	RF	RELIEF FAN
CR	CONDENSER WATER RETURN	CA	CASSETTE AIR-CONDITIONING UNIT
C	CONDENSER WATER SUPPLY	SD	SUPPLY DIFFUSER
PV	POWER VENTILATOR	RG	RETURN GRILLE
P	PUMP		
L	LOUVER		
FT	FIN TUBE		
CU	CONDENSING UNIT		
CH	WATER CHILLER		
VAV	VARIABLE AIR VOLUME		
UH	UNIT HEATER		
AFF	ABOVE FINISH FLOOR		
OED	OPEN END DUCT		

Milwaukee Water Engineering
Department of Public Works

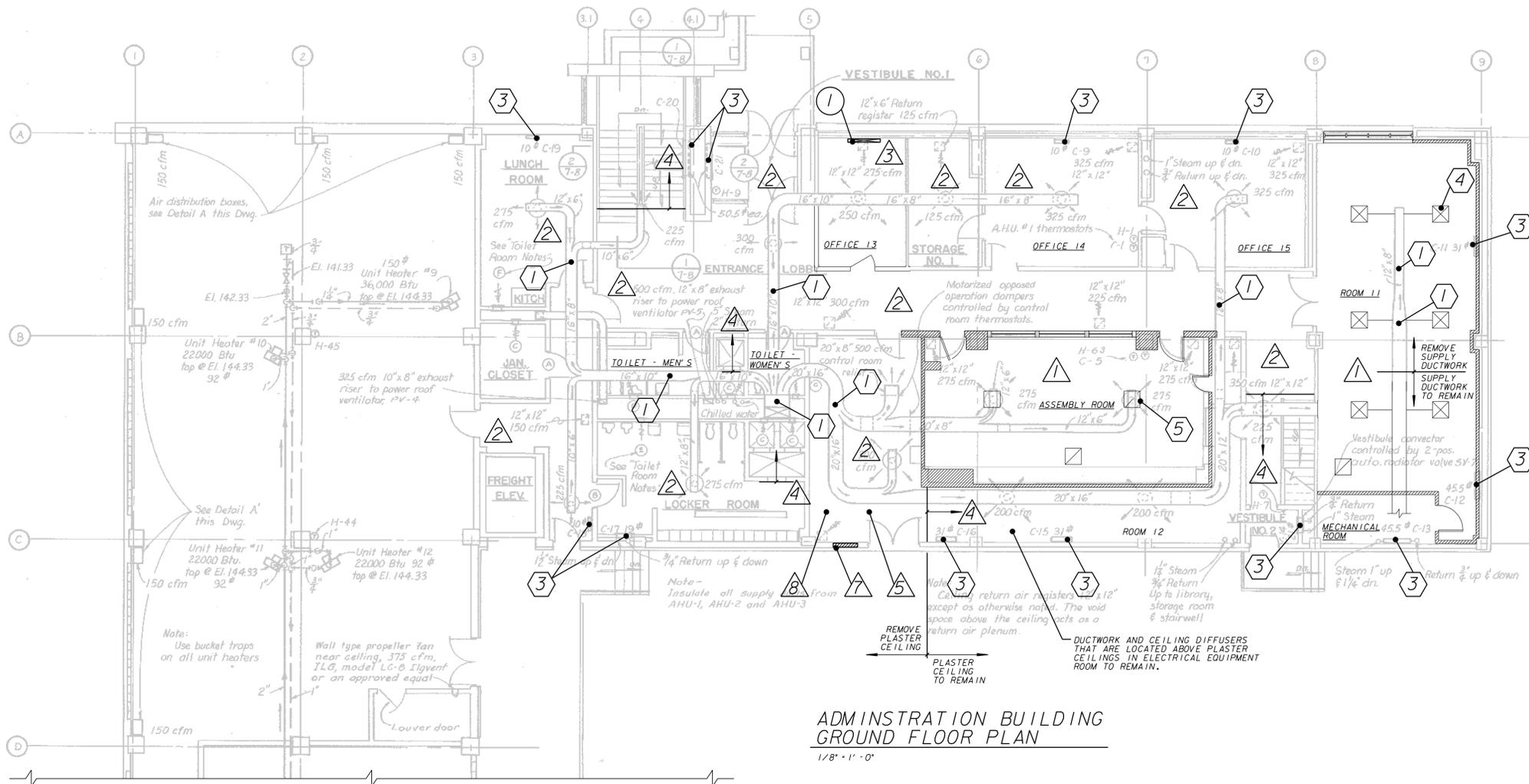
HOWARD AVENUE PURIFICATION PLANT

ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS HP-179

BASEMENT PLAN - DEMOLITION

DESIGNED BY	M.A.G.	DATE	9-25-12
DRAWN BY	J.F.S.	PLANT'S PROJECT ENGINEER	
CHECKED BY	A.J.S.	DATE	9-25-12
DATE	4-25-12	CHIEF DESIGN ENGINEER	
SCALE	AS SHOWN	DATE	9-25-12
WORK ORDER	WT450093300	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
OFFICIAL NOTICE	56-2012		
FILE NO.	B-12-2	DRAWING NO.	HP-179-02

NO.	BY	REVISION	DATE



ADMINISTRATION BUILDING
GROUND FLOOR PLAN
1/8" = 1' - 0"

DEMOLITION NOTES - GENERAL

1. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL DEMOLISHED EQUIPMENT AND MATERIAL OFF-SITE UNLESS OTHERWISE SPECIFIED.
2. FREIGHT ELEVATOR'S INTERIOR DIMENSIONS ARE APPROXIMATELY 5' - 6" X 8' - 0". ELEVATOR'S MAXIMUM CAPACITY IS 5,000 POUNDS.
3. CONTRACTOR IS RESPONSIBLE FOR PROTECTING EQUIPMENT AND FURNISHINGS FROM DUST AND PHYSICAL DAMAGE WHILE CEILINGS ARE BEING DEMOLISHED. CONTRACTOR SHALL PROVIDE TEMPORARY PROTECTION FOR EQUIPMENT AND FURNISHINGS THAT ARE PERMANENTLY INSTALLED. CONTRACTOR SHALL PROVIDE A MINIMUM 48-HOURS NOTICE PRIOR TO DEMOLISHING A SPACE'S CEILING. CONTRACTOR HAS THE OPTION OF RELOCATING MOVEABLE EQUIPMENT AND FURNISHINGS TO ANOTHER AREA OR PROVIDING TEMPORARY PROTECTION FOR SAID EQUIPMENT AND FURNISHINGS.
4. CONTRACTOR SHALL REMOVE ALL DEBRIS AND DUST THAT WAS A RESULT OF CEILING DEMOLITION. WALLS, FLOORS AND EQUIPMENT SHALL BE VACUUMED AND WIPED DOWN WITH A CLEANING SOLUTION.
5. CONTRACTOR SHALL DEMOLISH THE CEILINGS IN THE CORRIDORS, BATHROOMS, LOCKER ROOMS AND COMMON AREAS BEFORE OTHER SPACE'S CEILINGS ARE DEMOLISHED.
6. THE SUSPENDED GRID AND ACOUSTICAL TILED CEILING IN ROOM 11 AND ASSEMBLY ROOM SHALL NOT BE REMOVED UNTIL THE PLASTER CEILINGS IN ALL SPACES HAVE BEEN DEMOLISHED.
7. ONCE A SPACE'S CEILING HAS BEEN DEMOLISHED, THE CONTRACTOR SHALL PROTECT SAID SPACE FROM DUST & DEBRIS WHILE OTHER SPACE'S CEILINGS ARE BEING DEMOLISHED. NOT ALL INTERIOR WALLS EXTEND TO BUILDING'S CONCRETE STRUCTURE. THE ELEVATION ABOVE FINISH FLOOR OF SOME OF THE INTERIOR WALLS TOP IS APPROXIMATELY 9' - 0".
8. WHEN A SPACE'S CEILING IS REMOVED, THE CONTRACTOR SHALL PROVIDE TEMPORARY LIGHTING FOR THE SPACE. SEE ELECTRICAL SPECIFICATIONS AND DRAWINGS FOR MINIMUM REQUIREMENTS.

DEMOLITION NOTES - ARCHITECTURAL

1. EXISTING SUSPENDED GRID CEILING SYSTEM TO REMAIN. CONTRACTOR HAS THE OPTION TO REMOVE THE CEILING SYSTEM TO FACILITATE THE DEMOLITION AND INSTALLATION OF DUCTWORK. CEILING SYSTEMS SHALL THEN BE REPLACED WITH NEW OR ORIGINAL UNDAMAGED T-BARS. REUSE ORIGINAL UNDAMAGED ACOUSTICAL TILES.
2. REMOVE SPACE'S SUSPENDED METAL LATH AND PLASTER CEILING. REMOVE CEILING SUPPORTS.
3. REMOVE SPACE'S SUSPENDED METAL LATH AND PLASTER CEILING. REMOVE SUSPENDED GRID ACOUSTICAL TILE CEILING. REMOVE CEILING SUPPORTS.
4. PLASTER CEILING TO REMAIN. WHEN CEILINGS ARE DEMOLISHED IN SPACES WITH A SHOWER, CARE SHALL BE TAKEN TO NOT DAMAGE THE SHOWER AREA'S CEILING. THE PLASTER CEILING THAT REMAINS IN THE SHOWER AREA SHALL HAVE A STRAIGHT AND SMOOTH EDGE THAT BUTTS UP AGAINST FUTURE SOFFIT.
5. COORDINATE CEILING DEMOLITION IN THIS AREA WITH CITY. ELECTRICAL EQUIPMENT AND CONDUIT ARE MOUNTED TO THE CEILING IN THIS AREA. COMMUNICATION CABLE IS ROUTED OVER THE TOP OF THE CEILING IN THIS AREA. CITY WILL BE RESPONSIBLE FOR REMOUNTING EQUIPMENT, CONDUIT AND CABLES.
6. WHEN CEILINGS ARE DEMOLISHED IN SPACES WITH A WINDOW, CARE SHALL BE TAKEN TO NOT DAMAGE THE SOFFIT, SEE DETAIL 17/19.
7. REMOVE PORTION OF EXTERIOR WALL FOR NEW RELIEF AIR LOUVER.
8. EXTEND WALLS TO UNDERSIDE OF CONCRETE STRUCTURE WHERE CEILING HAS BEEN REMOVED. PROVIDE AN AIRTIGHT JOINT BETWEEN CONCRETE STRUCTURE AND WALL. ROOM 12'S ONLY CONNECTION TO CEILING PLENUM SHALL BE VIA THE WALL MOUNTED RETURN GRILLE.

DEMOLITION NOTES - HVAC

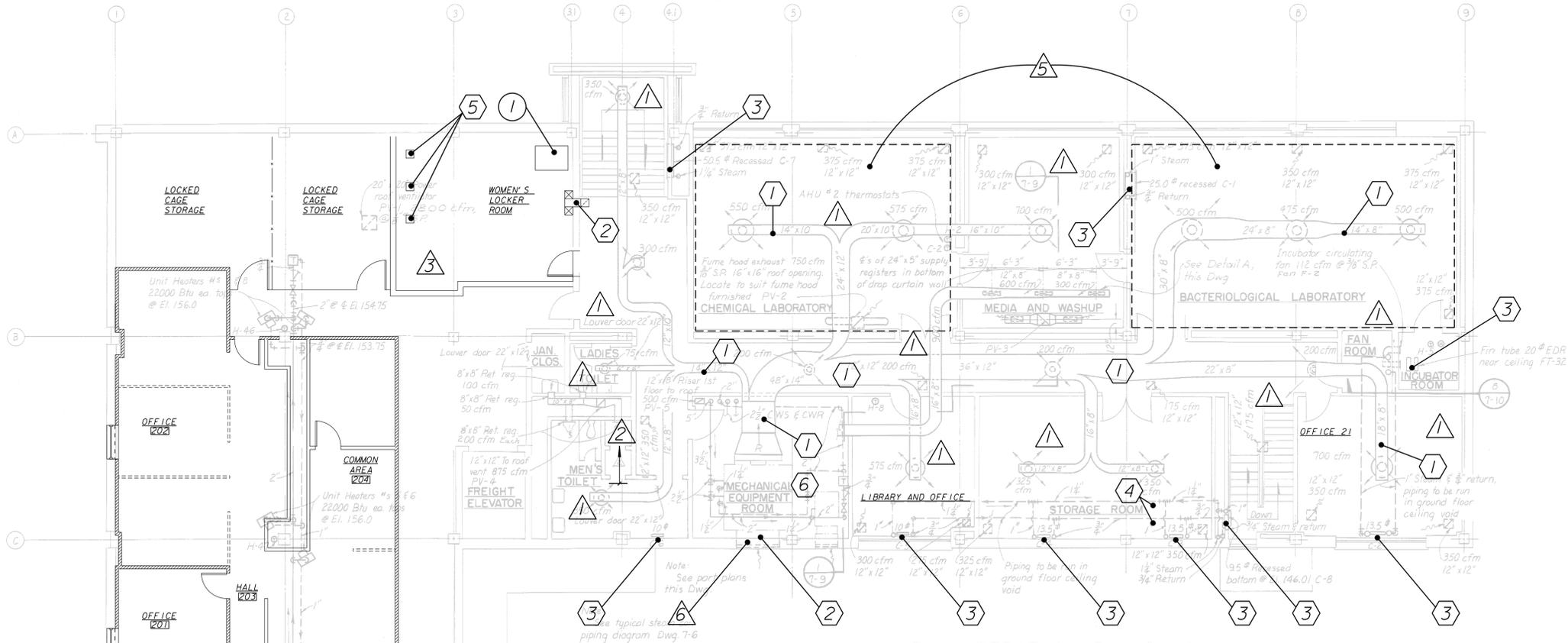
1. REMOVE SUPPLY-AIR DUCTWORK, CEILING DIFFUSERS, SUPPLY REGISTERS AND ASSOCIATED ACCESSORIES. REMOVE DUCT SUPPORTS.
2. REMOVE RETURN-AIR DUCTWORK, GRILLES AND ASSOCIATED ACCESSORIES. REMOVE DUCT SUPPORTS.
3. REMOVE STEAM CONVECTOR AND ASSOCIATED ACCESSORIES.
4. REMOVE SIX (6) CEILING DIFFUSERS AND ASSOCIATED BRANCH DUCTWORK. PATCH OPENINGS IN MAIN DUCTWORK THAT IS TO REMAIN. RETURN-AIR GRILLE AND RETURN DUCT WORK TO REMAIN.
5. REMOVE TWO (2) CEILING DIFFUSERS AND RETURN GRILLE.

DEMOLITION NOTES - ELECTRICAL

1. REMOVE ELECTRICAL BASEBOARD, CONDUIT WIRING AND ASSOCIATED ACCESSORIES.
2. CONTRACTOR SHALL DISCONNECT AND REMOVE ALL POWER AND CONTROL WIRING CONNECTED TO HVAC EQUIPMENT BEING DEMOLISHED; WIRING SHALL BE REMOVED BACK TO PANEL.
3. CONTRACTOR MAY REUSE EXISTING CONDUIT WHERE APPLICABLE AND IN GOOD CONDITION, HOWEVER ALL ABANDONED CONDUITS SHALL BE REMOVED.
4. CITY FORCES SHALL BE RESPONSIBLE FOR REMOUNTING ALL LIGHTING FIXTURES AND ASSOCIATED WIRE AND CONDUIT.

NO.	BY	REVISION	DATE

Milwaukee Water Works Department of Public Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS HP-179			
GROUND FLOOR PLAN - DEMOLITION			
DESIGNED BY	M.A.G.	DATE	9-25-12
DRAWN BY	J.F.S.	PLANT'S PROJECT ENGINEER	
CHECKED BY	A.J.S.		
DATE	4-25-12	CHIEF DESIGN ENGINEER	
SCALE	AS SHOWN		
WORK ORDER	WT450093300	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
OFFICIAL NOTICE	59-2012		
FILE NO.	B-12-2	DRAWING NO.	HP-179-03



**ADMINISTRATION BUILDING
SECOND FLOOR PLAN**
1/8" = 1' - 0"

DEMOLITION NOTES - GENERAL

1. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL DEMOLISHED EQUIPMENT AND MATERIAL OFF-SITE UNLESS OTHERWISE SPECIFIED.
2. FREIGHT ELEVATOR'S INTERIOR DIMENSIONS ARE APPROXIMATELY 5' - 6" X 8' - 0". ELEVATOR'S MAXIMUM CAPACITY IS 5,000 POUNDS.
3. CONTRACTOR IS RESPONSIBLE FOR PROTECTING EQUIPMENT AND FURNISHINGS FROM DUST AND PHYSICAL DAMAGE WHILE CEILINGS ARE BEING DEMOLISHED. CONTRACTOR SHALL PROVIDE TEMPORARY PROTECTION FOR EQUIPMENT AND FURNISHINGS THAT ARE PERMANENTLY INSTALLED. CONTRACTOR SHALL PROVIDE A MINIMUM 48-HOURS NOTICE PRIOR TO DEMOLISHING A SPACE'S CEILING. CONTRACTOR HAS THE OPTION OF RELOCATING MOVEABLE EQUIPMENT AND FURNISHINGS TO ANOTHER AREA OR PROVIDING TEMPORARY PROTECTION FOR SAID EQUIPMENT AND FURNISHINGS.
4. CONTRACTOR SHALL REMOVE ALL DEBRIS AND DUST THAT WAS A RESULT OF CEILING DEMOLITION. WALLS, FLOORS AND EQUIPMENT SHALL BE VACUUMED AND WIPED DOWN WITH A CLEANING SOLUTION.
5. CONTRACTOR SHALL DEMOLISH THE CEILINGS IN THE CORRIDORS, BATHROOMS, LOCKER ROOMS AND COMMON AREAS BEFORE OTHER SPACE'S CEILINGS ARE DEMOLISHED.
7. ONCE A SPACE'S CEILING HAS BEEN DEMOLISHED, THE CONTRACTOR SHALL PROTECT SAID SPACE FROM DUST & DEBRIS WHILE OTHER SPACE'S CEILINGS ARE BEING DEMOLISHED. NOT ALL INTERIOR WALLS EXTEND TO BUILDING'S CONCRETE STRUCTURE. THE ELEVATION ABOVE FINISH FLOOR OF SOME OF THE INTERIOR WALLS TOP IS APPROXIMATELY 9' - 0".
7. WHEN A SPACE'S CEILING IS REMOVED, THE CONTRACTOR SHALL PROVIDE TEMPORARY LIGHTING FOR THE SPACE. SEE ELECTRICAL SPECIFICATIONS AND DRAWINGS FOR MINIMUM REQUIREMENTS.

DEMOLITION NOTES - ARCHITECTURAL

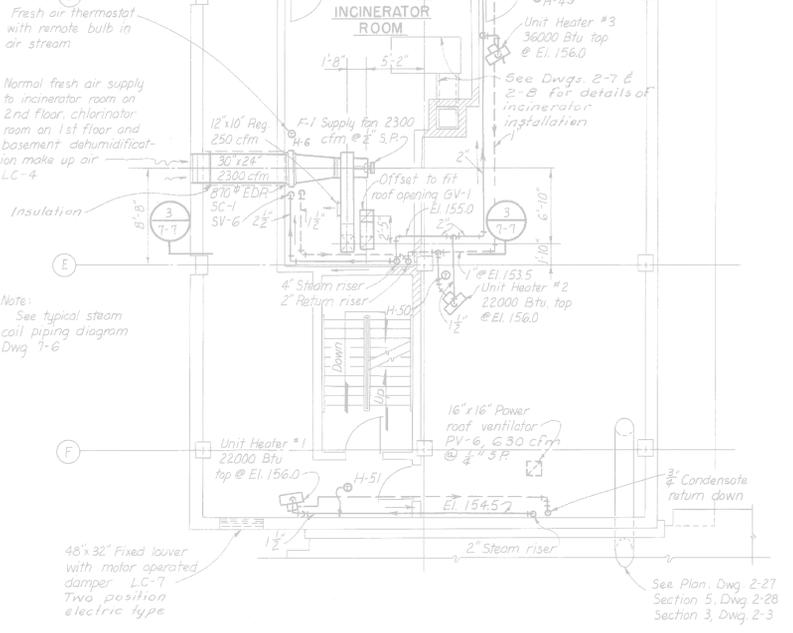
- 1 REMOVE SPACE'S SUSPENDED METAL LATH AND PLASTER CEILING. REMOVE CEILING SUPPORTS.
- 2 PLASTER CEILING TO REMAIN. WHEN CEILINGS ARE DEMOLISHED IN SPACES WITH A SHOWER, CARE SHALL BE TAKEN TO NOT DAMAGE THE SHOWER AREA'S CEILING. THE PLASTER CEILING THAT REMAINS IN THE SHOWER AREA SHALL HAVE A STRAIGHT AND SMOOTH EDGE THAT BUTTS UP AGAINST FUTURE SOFFIT.
- 3 REMOVE SUSPENDED GRID CEILING SYSTEM.
- 4 PLASTER CEILING TO REMAIN. WHEN CEILINGS ARE DEMOLISHED IN SPACES WITH A SHOWER, CARE SHALL BE TAKEN TO NOT DAMAGE THE SHOWER AREA'S CEILING. THE PLASTER CEILING THAT REMAINS IN THE SHOWER AREA SHALL HAVE A STRAIGHT AND SMOOTH EDGE THAT BUTTS UP AGAINST FUTURE SOFFIT.
- 5 THE CONTRACTOR SHALL PROVIDE A SPACE THAT DOES NOT ALLOW DUST AND DEBRIS FROM DEMOLITION AND CONSTRUCTION ACTIVITIES TO ENTER THE SPACE. EITHER THE CHEMICAL LABORATORY OR BACTERIOLOGICAL LABORATORY SHALL BE THIS SPACE. THE OPENING BETWEEN THE TOP OF THE INTERIOR WALLS AND THE UNDERSIDE OF THE ROOF DECK SHALL BE SEALED AIRTIGHT. A DUST-FREE SPACE IS REQUIRED BY AN OPERATING WATER PURIFICATION PLANT TO PERFORM DAILY TESTS.
- 6 REMOVE PORTION OF EXTERIOR WALL FOR NEW INTAKE LOUVER.
- 7 WHEN CEILINGS ARE DEMOLISHED IN SPACES WITH A WINDOW, CARE SHALL BE TAKEN TO NOT DAMAGE THE SOFFIT. SEE DETAIL 1/19.

DEMOLITION NOTES - HVAC

- 1 REMOVE SUPPLY-AIR DUCTWORK, CEILING DIFFUSERS, SUPPLY REGISTERS AND ASSOCIATED ACCESSORIES. REMOVE DUCT SUPPORTS.
- 2 REMOVE RETURN-AIR DUCTWORK, GRILLES AND ASSOCIATED ACCESSORIES. REMOVE DUCT SUPPORTS.
- 3 REMOVE STEAM CONVECTOR AND ASSOCIATED ACCESSORIES.
- 4 REMOVE STEAM BRANCH PIPING AND CONDENSATE BRANCH PIPING TO CONVECTORS. REMOVE ASSOCIATED ACCESSORIES. REMOVE PIPE SUPPORTS. ALL CONVECTORS IN ADMINISTRATION BUILDING SHALL BE REMOVED.
- 5 REMOVE EXISTING EXHAUST GRILLES AND REINSTALL IN NEW CEILING.
- 6 REMOVE AHU #1, AHU #2, AHU #3 AND ASSOCIATED ACCESSORIES. REMOVE CWS, CWR AND CONDENSATE PIPING. REMOVE STEAM AND CONDENSATE PIPING. REMOVE AHU, PIPING AND DUCT SUPPORTS. REMOVE LOUVERS FOR AHU#1, AHU#2 AND AHU#3.

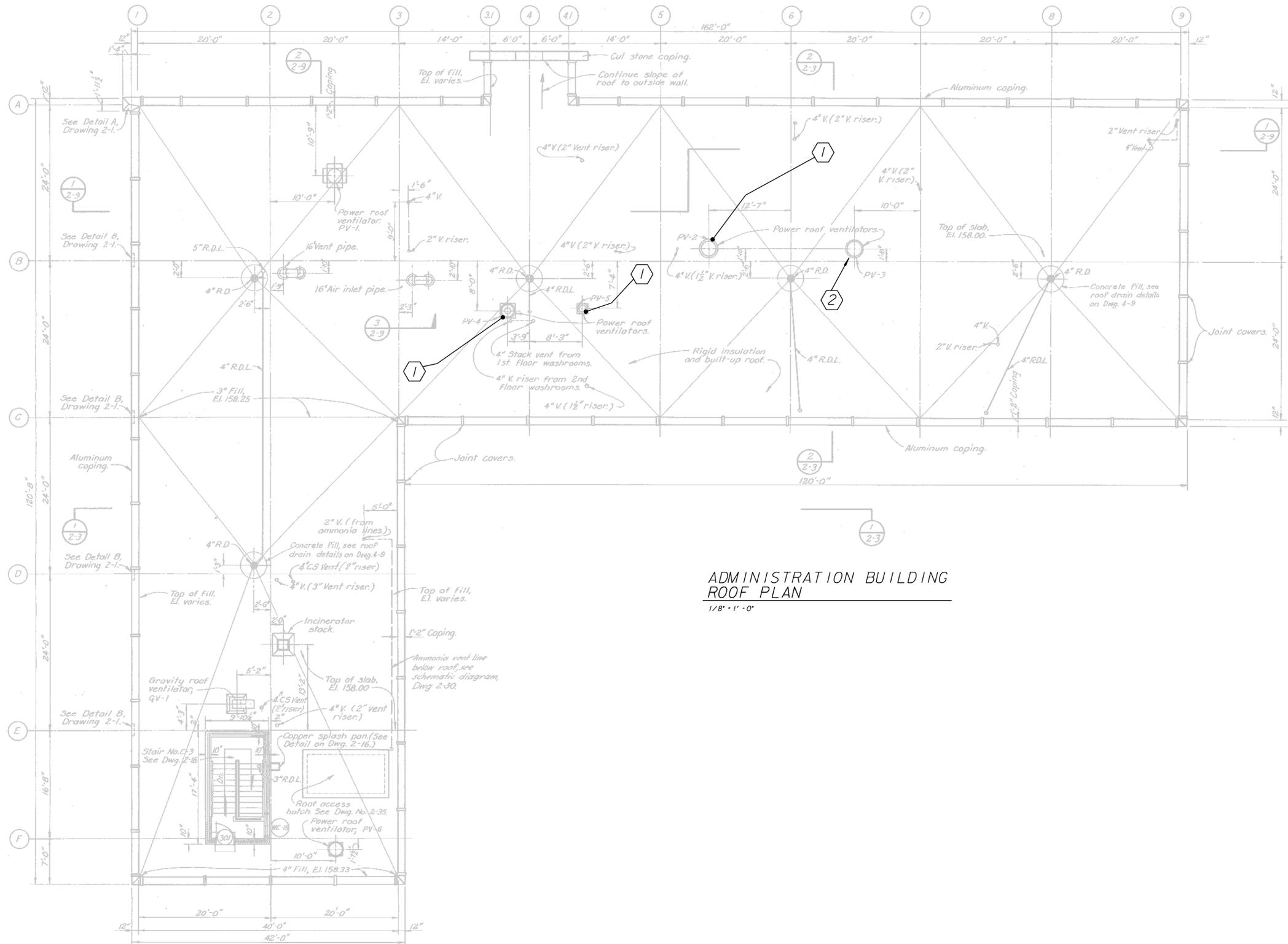
DEMOLITION NOTES - ELECTRICAL

- 1 REMOVE ELECTRICAL CABINET UNIT HEATER AND ASSOCIATED CONTROLS.
- 2 CONTRACTOR SHALL DISCONNECT AND REMOVE ALL POWER AND CONTROL WIRING CONNECTED TO HVAC EQUIPMENT BEING DEMOLISHED; WIRING SHALL BE REMOVED BACK TO PANEL.
- 3 CONTRACTOR MAY REUSE EXISTING CONDUIT WHERE APPLICABLE AND IN GOOD CONDITION, HOWEVER ALL ABANDONED CONDUITS SHALL BE REMOVED
- 4 CITY FORCES SHALL BE RESPONSIBLE FOR REMOUNTING ALL LIGHTING FIXTURES AND ASSOCIATED WIRE AND CONDUIT.



Milwaukee Water Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
SECOND FLOOR PLAN - DEMOLITION			
DESIGNED BY	M.A.G.	DATE	9-25-12
DRAWN BY	J.F.S.	PROJECT ENGINEER	
CHECKED BY	A.J.S.	DATE	4-25-12
SCALE	AS SHOWN	DATE	9-25-12
WORK ORDER	WT450093300	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
OFFICIAL NOTICE	56-2012	FILE NO.	8-12-2
DRAWING NO. HP-179-04			

NO.	BY	REVISION	DATE



ADMINISTRATION BUILDING
ROOF PLAN
1/8" = 1' - 0"

DEMOLITION NOTES - GENERAL

1. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL DEMOLISHED EQUIPMENT AND MATERIAL OFF-SITE UNLESS OTHERWISE SPECIFIED.

DEMOLITION NOTES - HVAC

- 1 REMOVE POWERED ROOF VENTILATOR AND DAMPER
- 2 REMOVE POWERED ROOF VENTILATOR AND DAMPER
REMOVE ASSOCIATED DUCTWORK AND SUPPORTS

DEMOLITION NOTES - ELECTRICAL

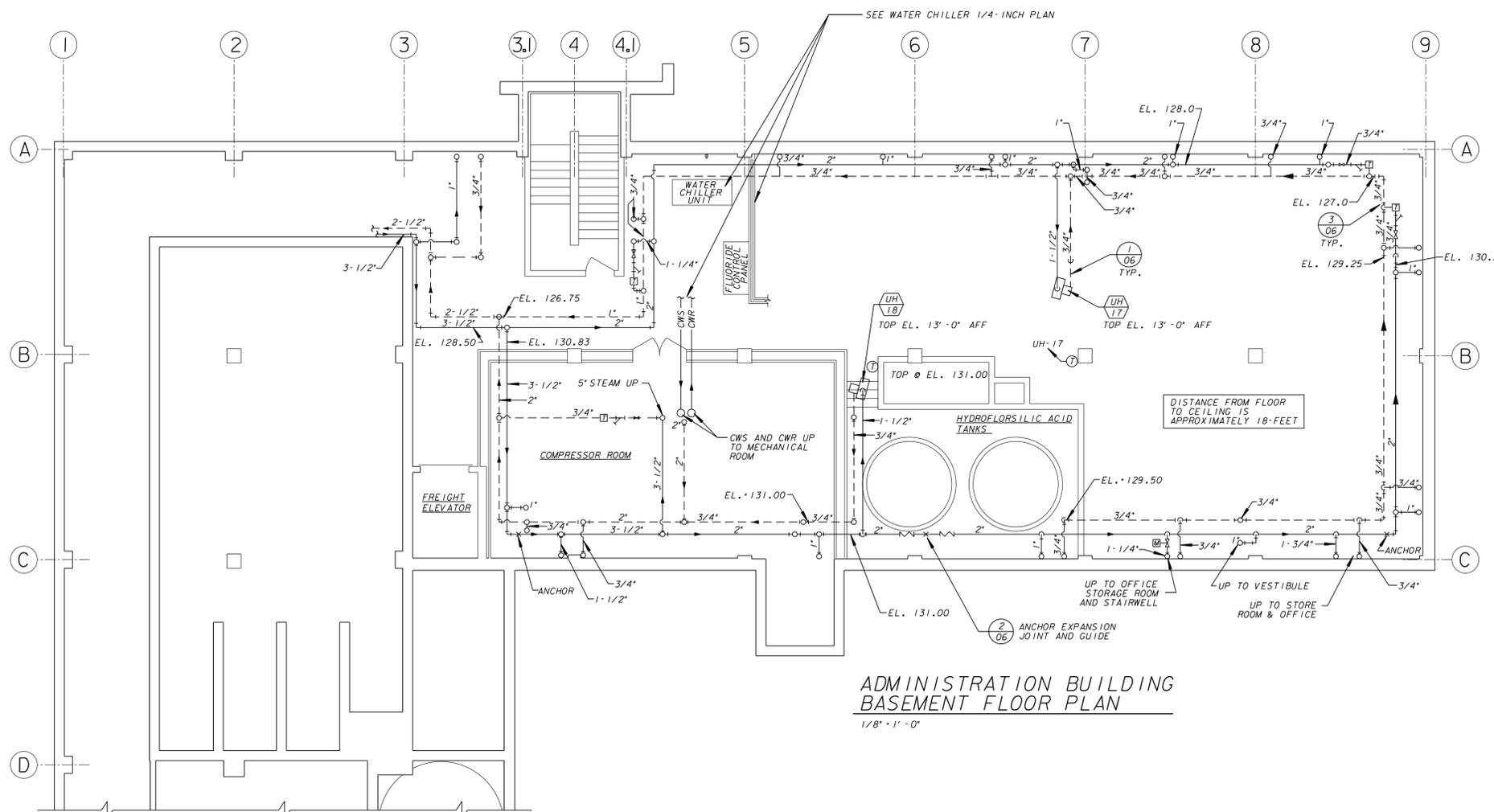
- 1 REMOVE ELECTRICAL BASEBOARD, CONDUIT WIRING AND ASSOCIATED ACCESSORIES.
- 2 CONTRACTOR SHALL DISCONNECT AND REMOVE ALL POWER AND CONTROL WIRING CONNECTED TO HVAC EQUIPMENT BEING DEMOLISHED; WIRING SHALL BE REMOVED BACK TO PANEL.
- 3 CONTRACTOR MAY REUSE EXISTING CONDUIT WHERE APPLICABLE AND IN GOOD CONDITION, HOWEVER ALL ABANDONED CONDUITS SHALL BE REMOVED
- 4 CITY FORCES SHALL BE RESPONSIBLE FOR REMOUNTING ALL LIGHTING FIXTURES AND ASSOCIATED WIRE AND CONDUIT.

Milwaukee Water Engineering
Department of Public Works

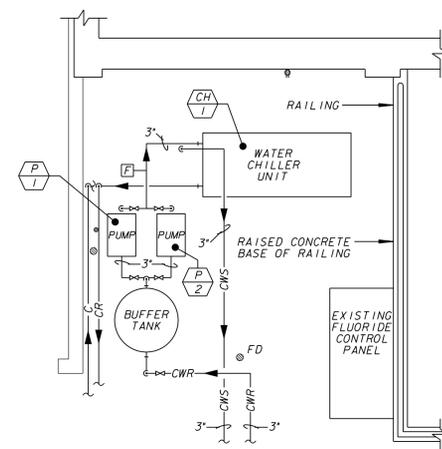
HOWARD AVENUE PURIFICATION PLANT
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS
HP-179
ROOF PLAN - DEMOLITION

DESIGNED BY	M.A.G.	PROVED	DATE
DRAWN BY	J.F.S.	<i>Andrew Reynolds</i>	9-25-12
CHECKED BY	A.J.S.	<i>Daniel G. Hart</i>	9-25-12
DATE	4-25-12	<i>Andrew Reynolds</i>	9-25-12
SCALE	AS SHOWN	<i>Andrew Reynolds</i>	9-25-12
WORK ORDER	WT450093300	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
OFFICIAL NOTICE	56-2012	DRAWING NO. HP-179-05	
FILE NO.	B-12-2		

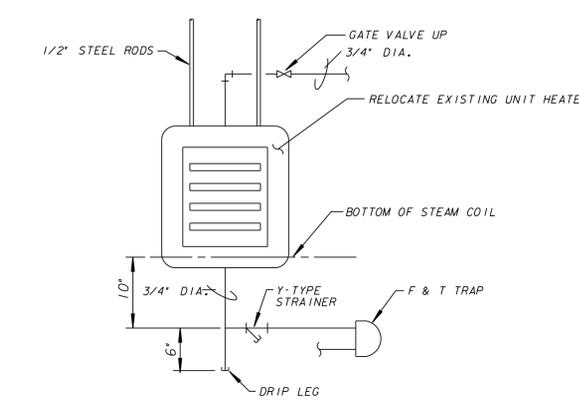
NO.	BY	REVISION	DATE



**ADMINISTRATION BUILDING
BASEMENT FLOOR PLAN**
1/8" = 1' - 0"

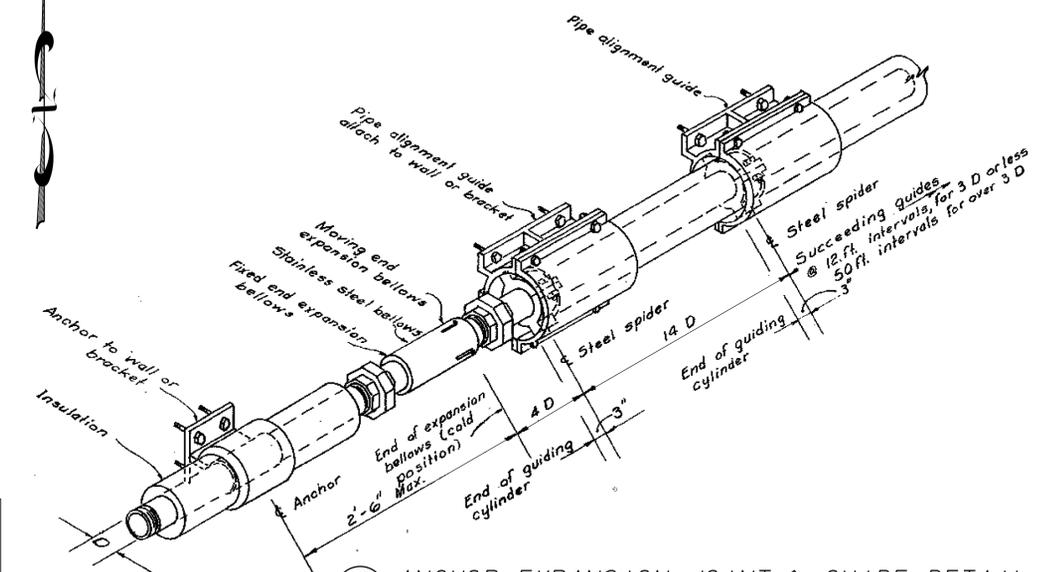


WATER CHILLER PLAN
1/4" = 1' - 0"

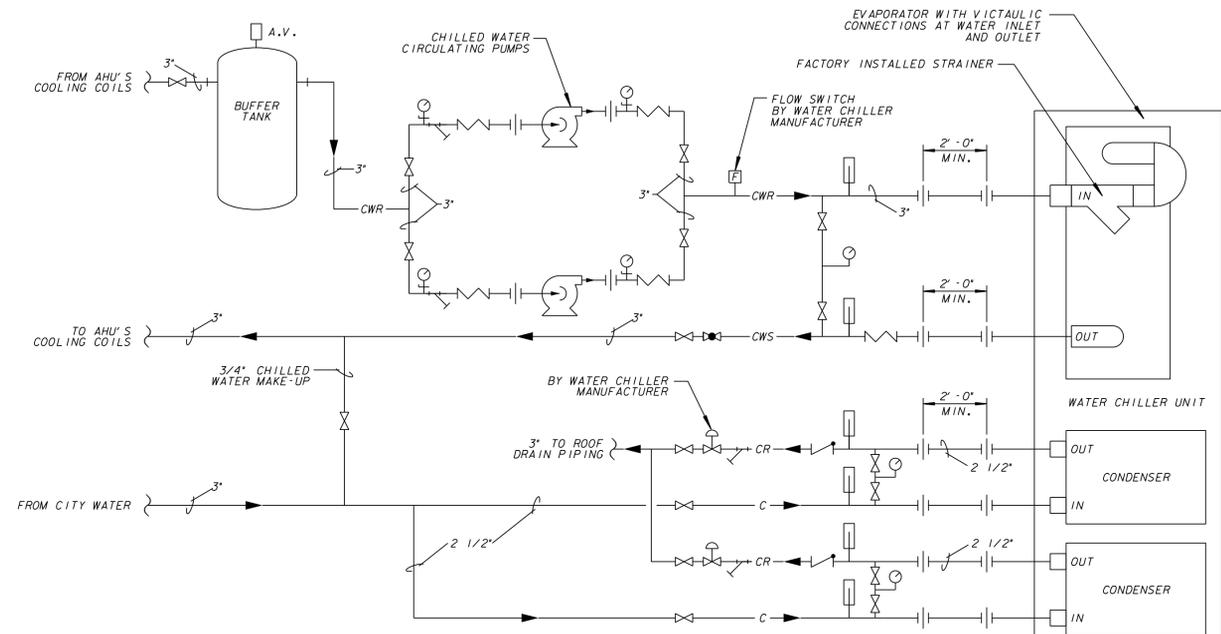


UNIT HEATER PIPING DETAILS
NOT TO SCALE

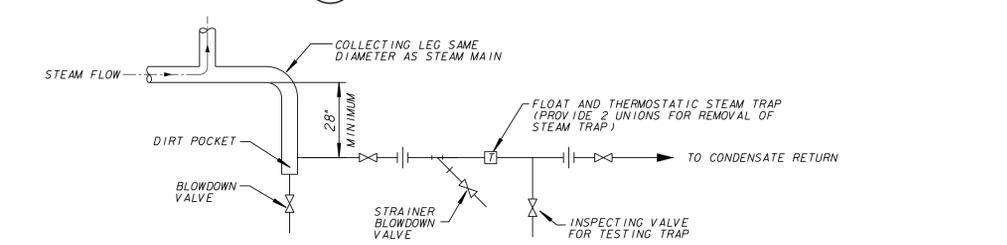
PROVIDE THE FOLLOWING ACCESSORIES:
GATE VALVE: CRANE, BRONZE BODY, CLASS 125, 3/4", RISING STEM.
Y-TYPE STRAINER: BESTOBELL, CAST IRON BODY, CLASS 125, 3/4".
F & T TRAP: BESTOBELL, FT SERIES, FT015, 2 PSI AP, 3/4" 1225 BS/HR.



ANCHOR EXPANSION JOINT & GUIDE DETAIL
NOT TO SCALE



WATER CHILLER PIPING DIAGRAM
NOT TO SCALE

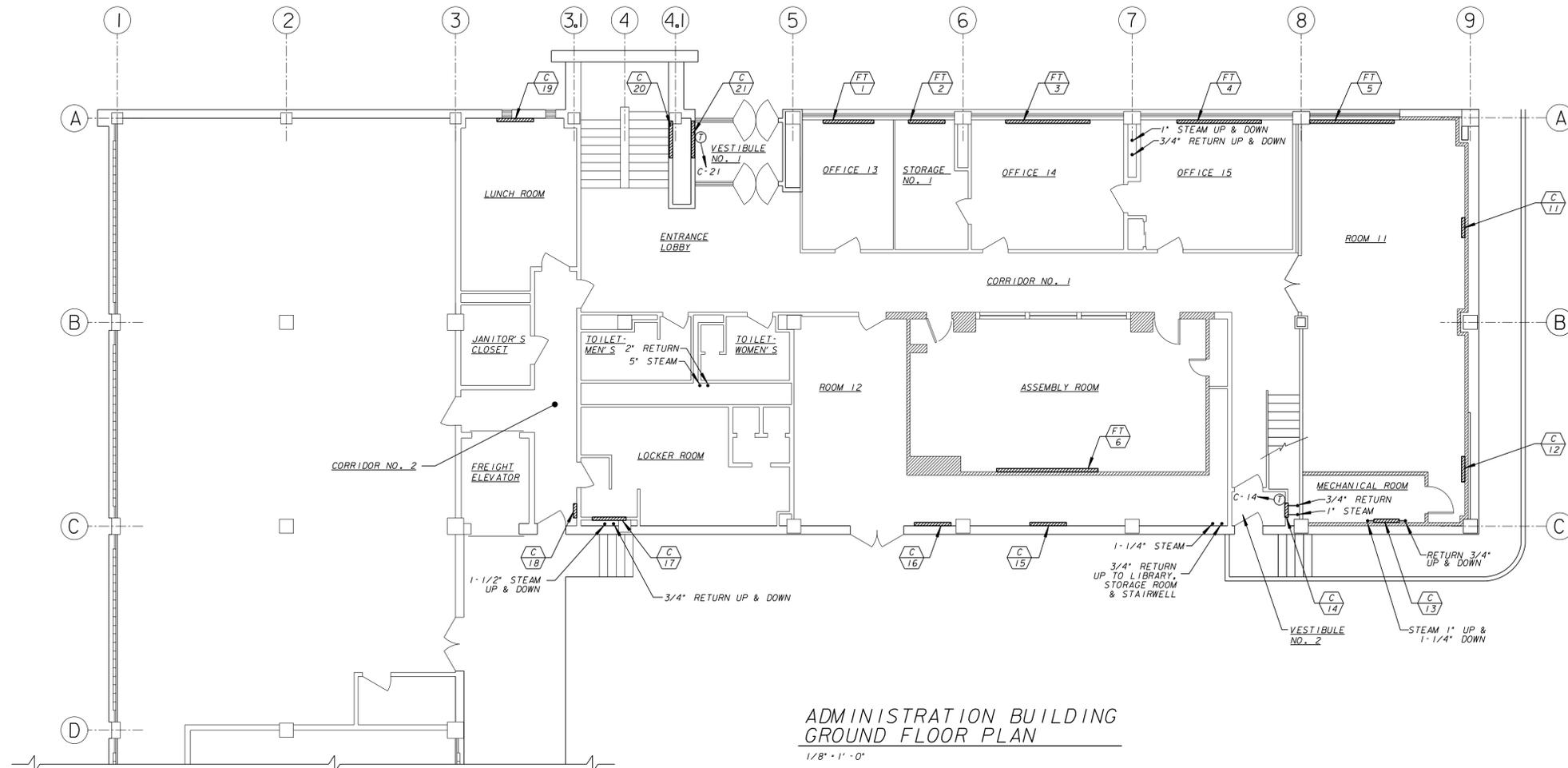


DRIP LEG W/STEAM TRAP DIAGRAM
NOT TO SCALE

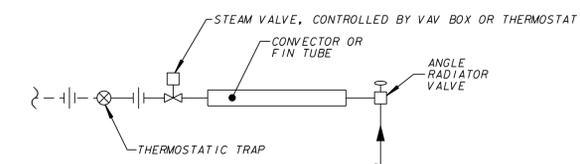
- NOTES:
- 1) PROVIDE DRAIN VALVES AND VENT COCKS ON EVAPORATOR AND EACH CONDENSER.
 - 2) CONDENSER PIPING SHALL BE IN ACCORDANCE WITH ALL LOCAL AND NATIONAL CODES.
 - 3) PROVIDE REFRIGERANT PRESSURE RELIEF PIPING PER ANSI/ASHRAE 15-2007 GUIDELINES STATE CODE AND LOCAL CODE.
 - 4) PROVIDE CROSS CONNECTED PRESSURE GAUGE, WITH ISOLATION VALVE, ON CHILLED WATER PUMPS, 1/4 INCH DIAMETER STAINLESS STEEL PIPING.

Milwaukee Water Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
BASEMENT PLAN - HVAC PIPING			
DESIGNED BY	M.A.G.	DATE	9-25-12
DRAWN BY	J.F.S.	PLANT PROJECT ENGINEER	
CHECKED BY	A.J.S.	DATE	4-25-12
SCALE	AS SHOWN	CHIEF DESIGN ENGINEER	
WORK ORDER	WT450093300	DATE	9-25-12
OFFICIAL NOTICE	56-2012	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
FILE NO.	B-12-2	DRAWING NO.	HP-179-06

NO.	BY	REVISION	DATE



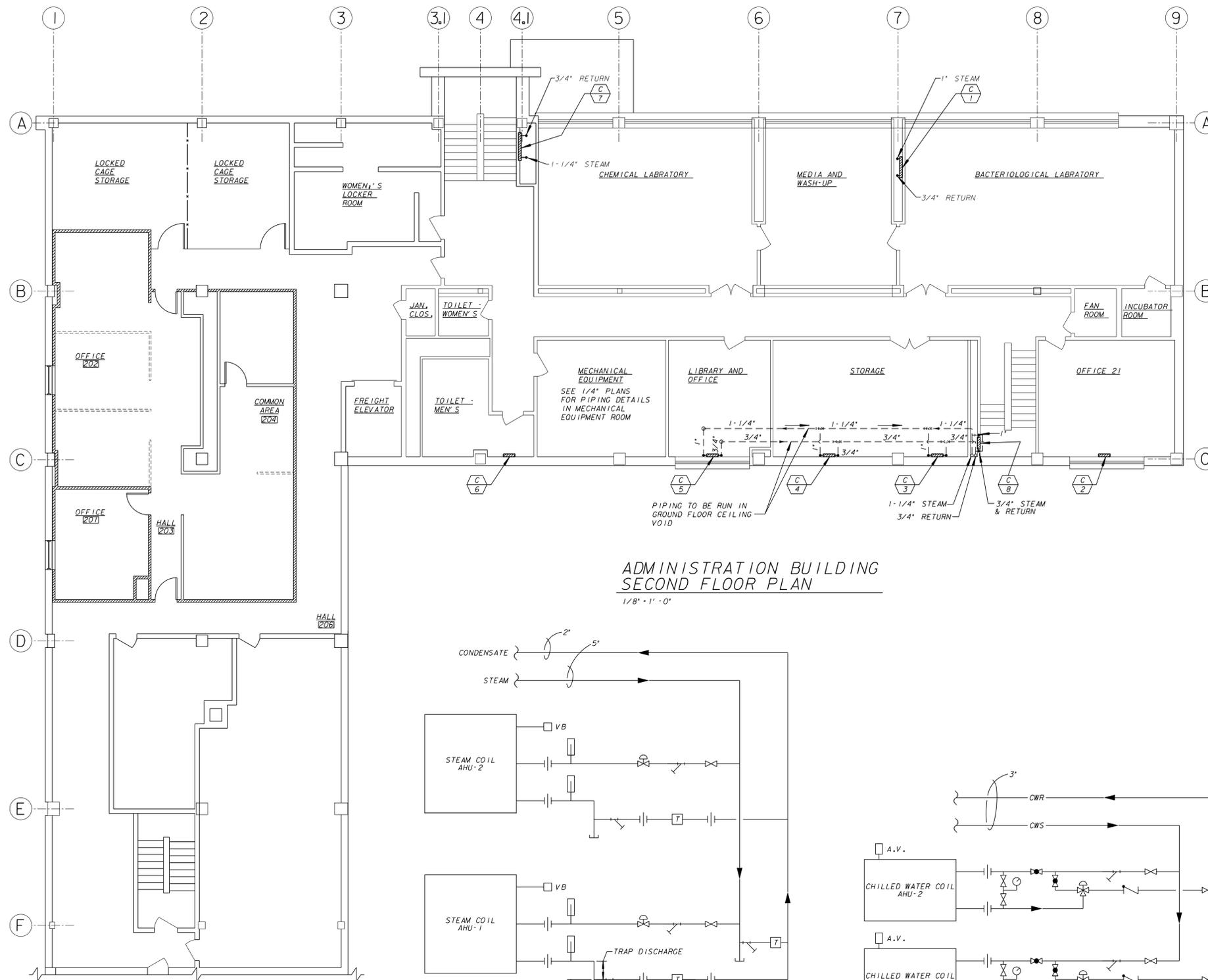
ADMINISTRATION BUILDING
GROUND FLOOR PLAN
1/8" = 1' - 0"



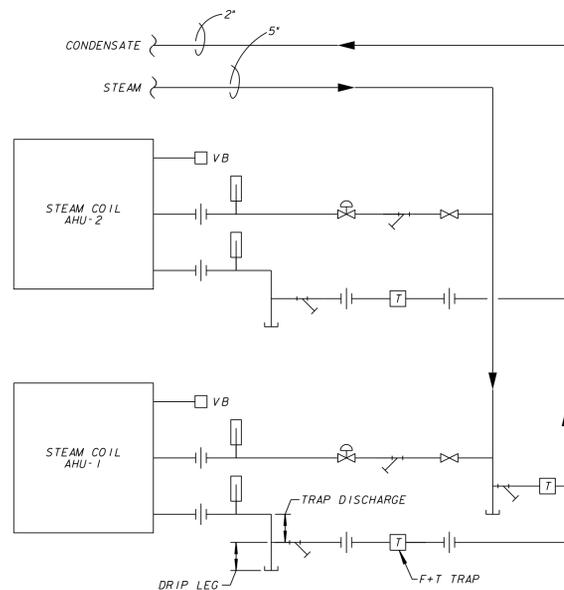
TERMINAL UNIT DETAIL
NOT TO SCALE

Milwaukee Water Works Department of Public Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
GROUND FLOOR PLAN - HVAC PIPING			
DESIGNED BY	M.A.G.	APPROVED	DATE
DRAWN BY	J.F.S.	<i>Andrew Reynolds</i>	9-25-12
CHECKED BY	A.J.S.	<i>Daniel G. Hart</i>	PLANT'S PROJECT ENGINEER
DATE	4-25-12	<i>William</i>	9-25-12
SCALE	AS SHOWN		CHIEF DESIGN ENGINEER
WORK ORDER	WT450093300		9-25-12
OFFICIAL NOTICE	56-2012		SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS
FILE NO.	B-12-2	DRAWING NO. HP-179-07	

NO.	BY	REVISION	DATE

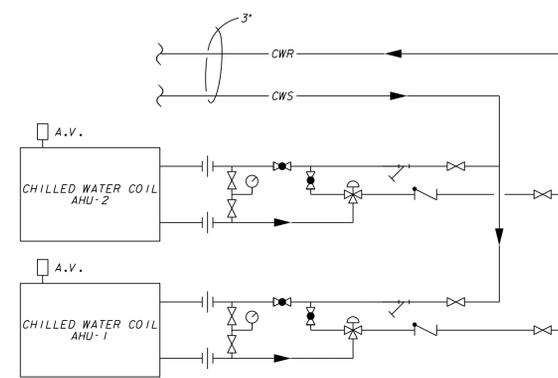


ADMINISTRATION BUILDING
SECOND FLOOR PLAN
1/8" = 1' - 0"



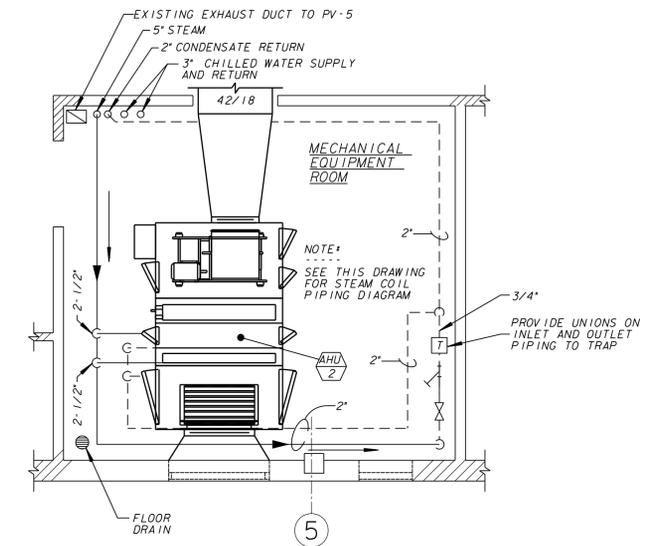
STEAM COIL PIPING DIAGRAM

- NOTES:
- 1) 12" MINIMUM STEAM TRAP DISCHARGE
 - 2) 6" DRIP LEG. DRIP LEGS SHALL BE FULL SIZE OF MAIN.
 - 3) PIPE ENTERING AND LEAVING STEAM TRAP SHALL BE FULL SIZE OF TRAP CONNECTIONS.
 - 4) PIPE LEAVING COIL SHALL BE FULL SIZE OF COIL CONNECTION.
 - 5) PROVIDE UNIONS AT PIPE ENTERING AND LEAVING CONTROL VALVES.
 - 6) PROVIDE UNIONS AT PIPE ENTERING AND LEAVING STEAM TRAP.

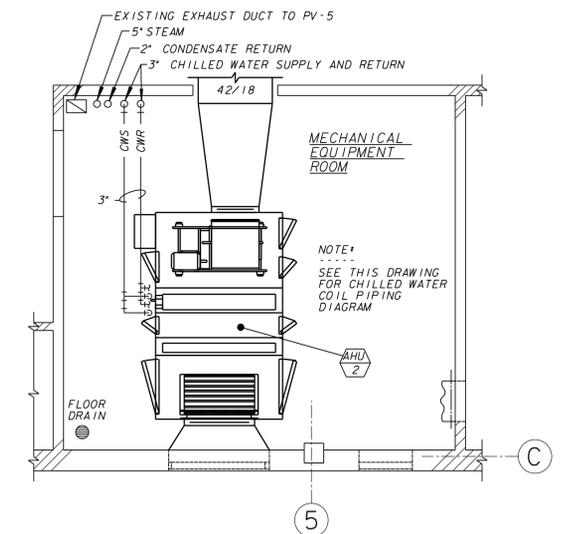


COOLING COIL PIPING DIAGRAM

- NOTES:
- 1) PROVIDE UNIONS AT PIPE ENTERING AND LEAVING CONTROL VALVES.
 - 2) PIPE LEAVING COIL SHALL BE FULL SIZE OF COIL CONNECTION.



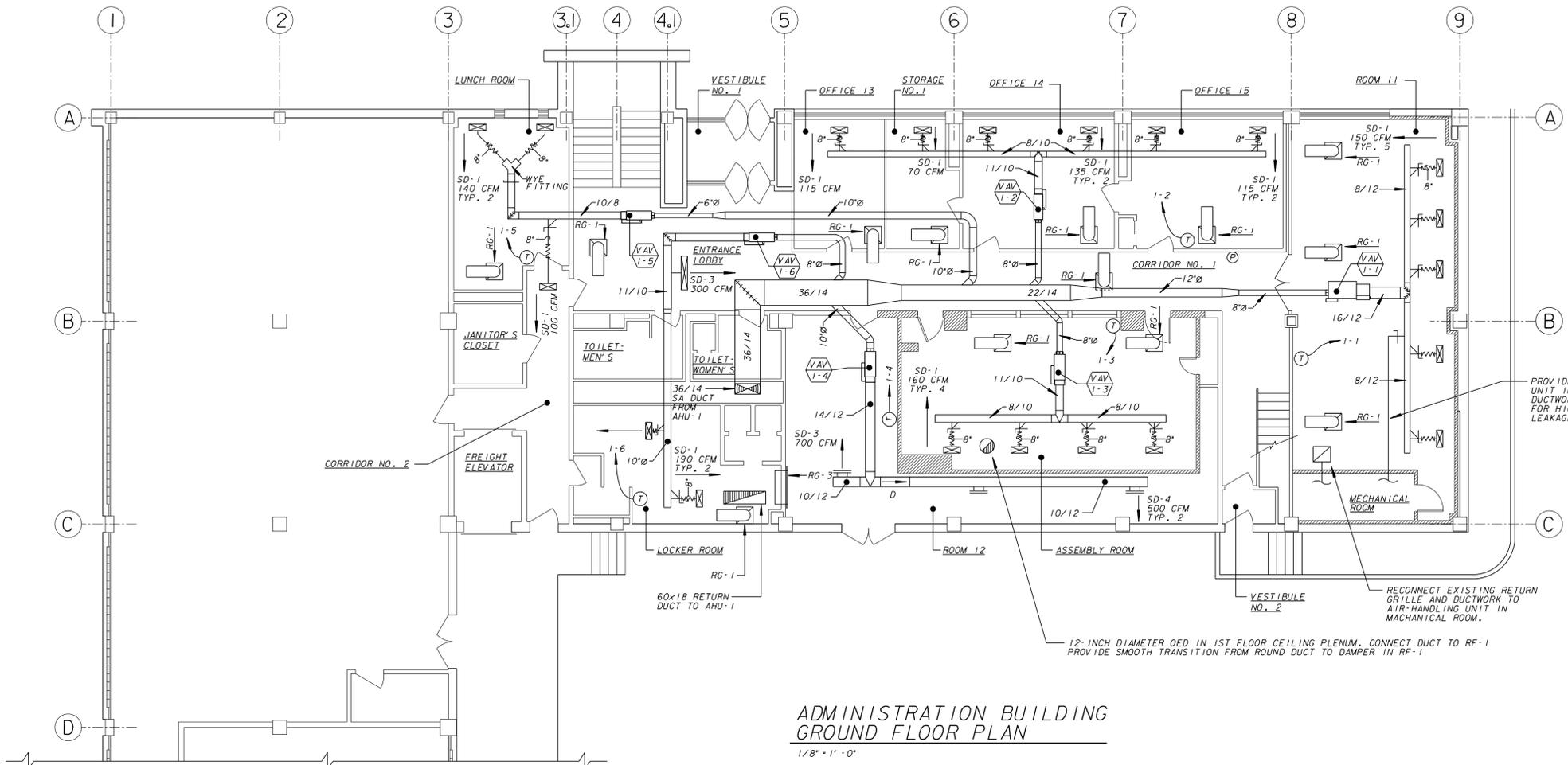
MECHANICAL EQUIPMENT ROOM PLAN -
STEAM PIPING
1/4" = 1' - 0"



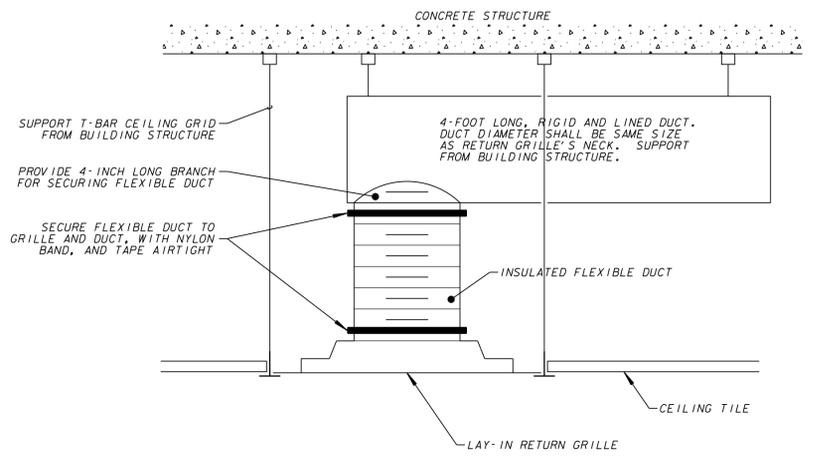
MECHANICAL EQUIPMENT ROOM PLAN -
CHILLED WATER PIPING
1/4" = 1' - 0"

NO.	BY	REVISION	DATE

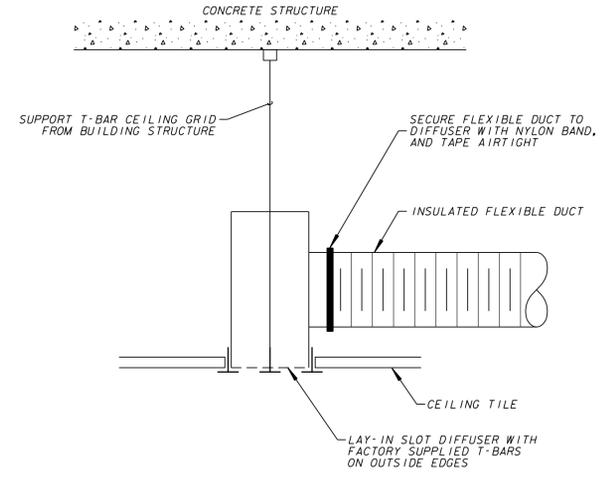
Milwaukee Water Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
SECOND FLOOR PLAN - HVAC PIPING			
DESIGNED BY	M.A.G.	PROVED	DATE
DRAWN BY	J.F.S.	<i>Andrew Reynolds</i>	9-25-12
CHECKED BY	A.J.S.	<i>Daniel G. Smith</i>	PLANT PROJECT ENGINEER
DATE	4-25-12	<i>William</i>	9-25-12
SCALE	AS SHOWN		CHIEF DESIGN ENGINEER
WORK ORDER	WT450093300		9-25-12
OFFICIAL NOTICE	56-2012		SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS
FILE NO.	B-12-2	DRAWING NO. HP-179-08	



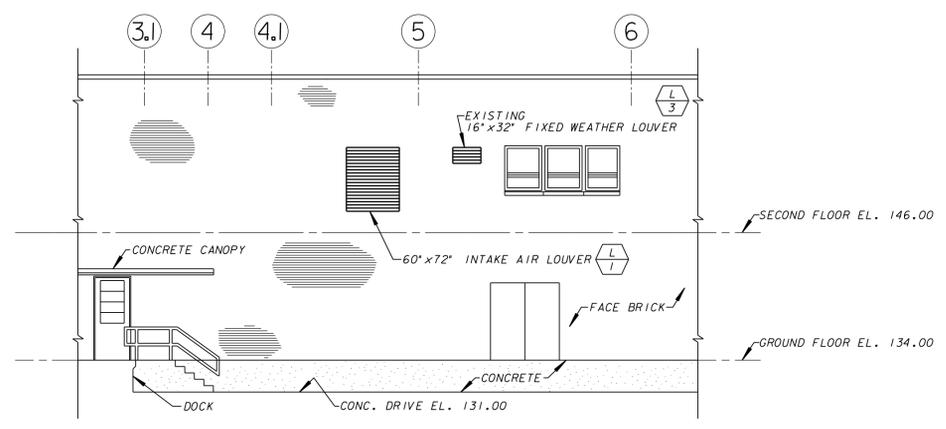
ADMINISTRATION BUILDING
GROUND FLOOR PLAN
1/8" = 1' - 0"



RETURN GRILLE DETAIL
NOT TO SCALE



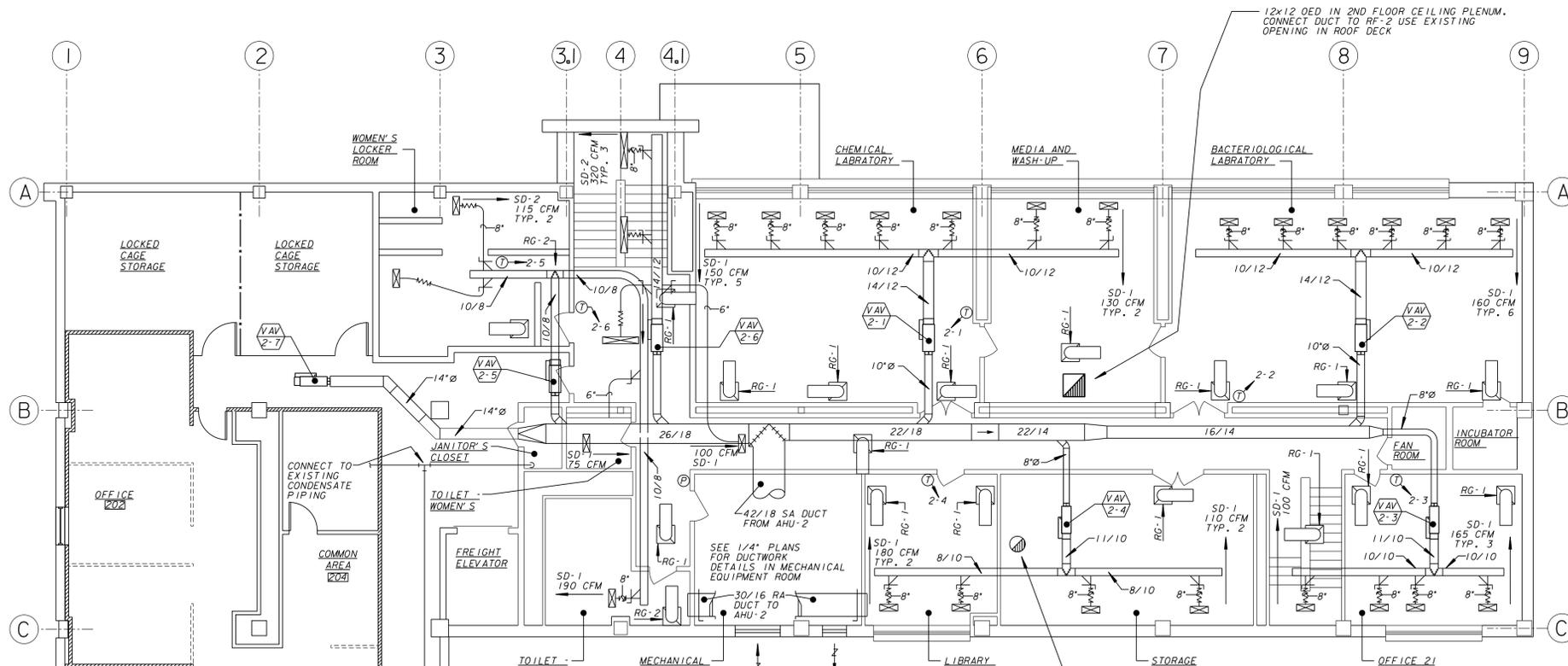
SLOT DIFFUSER DETAIL
NOT TO SCALE



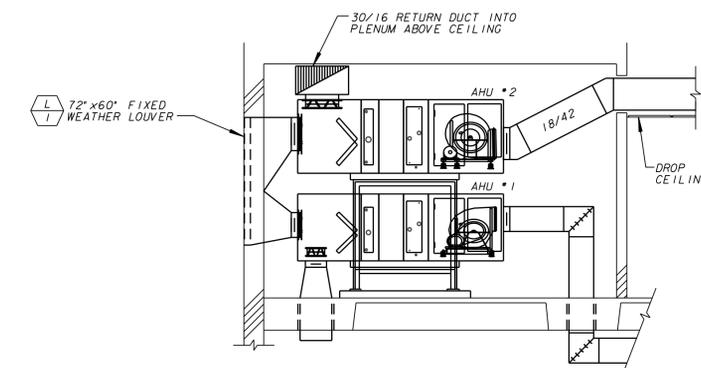
LOUVER ELEVATION
1/8" = 1' - 0"

NO.	BY	REVISION	DATE

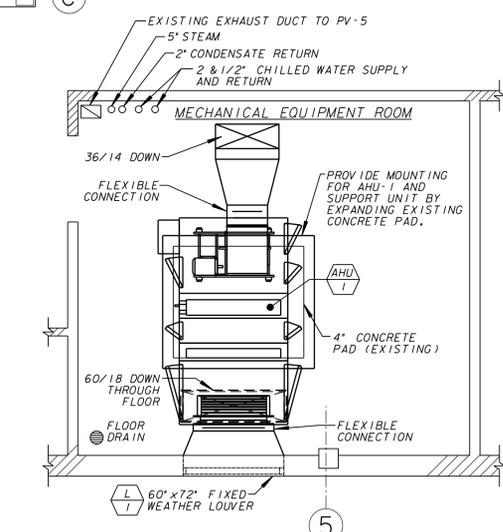
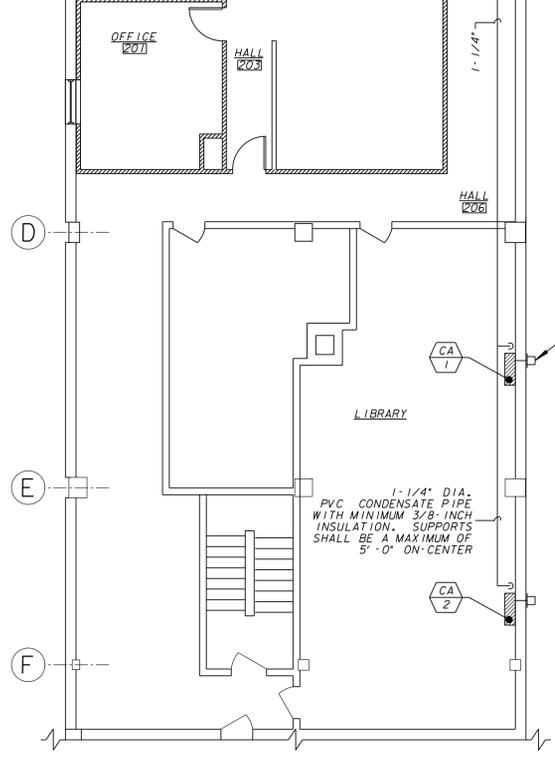
Milwaukee Water Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
GROUND FLOOR PLAN - HVAC DUCTWORK			
DESIGNED BY	M.A.G.	PROVED	DATE
DRAWN BY	J.F.S.	<i>Andrew Reynolds</i>	9-25-12
CHECKED BY	A.J.S.	<i>Daniel G. Hart</i>	9-25-12
DATE	4-25-12	<i>William</i>	9-25-12
SCALE	AS SHOWN		
WORK ORDER	WT450093300		
OFFICIAL NOTICE	56-2012		
FILE NO.	B-12-2		
		DRAWING NO. HP-179-09	



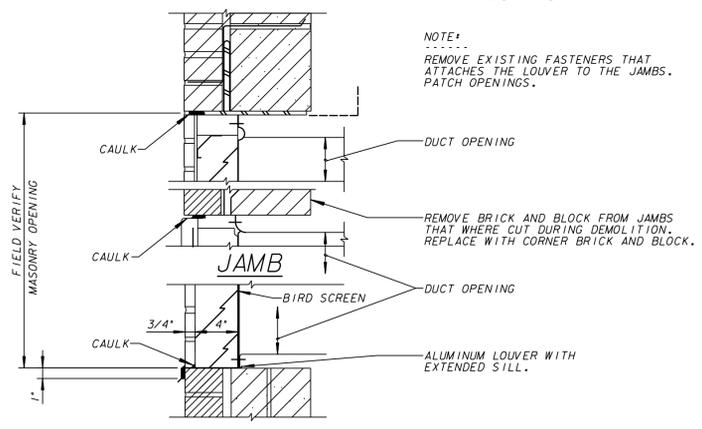
**ADMINISTRATION BUILDING
SECOND FLOOR PLAN**
1/8" = 1' - 0"



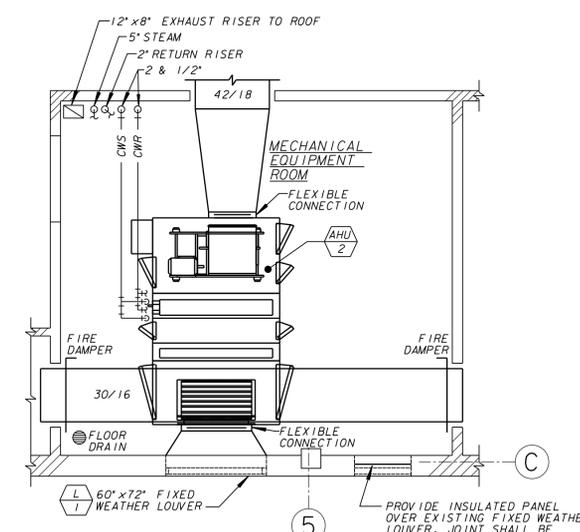
**ELEVATION OF AIR
HANDLING UNITS 1 & 2**
1/4" = 1' - 0"



**PLAN OF AIR HANDLING UNIT 1
FOR GROUND FLOOR**
1/4" = 1' - 0"

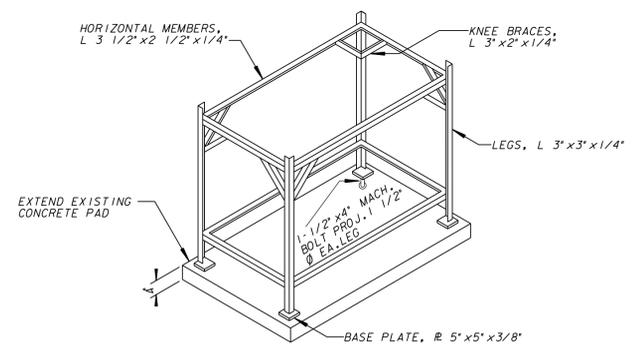


LOUVER DETAILS
1-1/2" = 1' - 0"



- NOTES:
- 1) CENTER AHU-1 ON LOUVER L-1. SUPPLY DUCT SHALL BE CENTERED ON AHU'S OUTLET. ENLARGE EXISTING OPENINGS IN FLOOR TO ACCOMMODATE SUPPLY AND RETURN DUCTS. PATCH EXISTING OPENINGS IN FLOOR. PROVIDE WATERTIGHT SEAL BETWEEN DUCT AND FLOOR.
 - 2) CENTER AHU-2 ON LOUVER L-1. SUPPLY DUCT SHALL BE CENTERED ON AHU'S OUTLET. ENLARGE EXISTING OPENINGS IN WALL TO ACCOMMODATE SUPPLY AND RETURN DUCTS. PATCH EXISTING OPENINGS IN WALL. PROVIDE AIRTIGHT SEAL BETWEEN DUCT AND WALLS.
 - 3) PROVIDE AUTOMATIC FIRE DAMPERS WITH FUSIBLE LINKS IN EACH RETURN AIR DUCT WHERE IT PASSES THROUGH EQUIPMENT ROOM WALLS AND FLOORS.

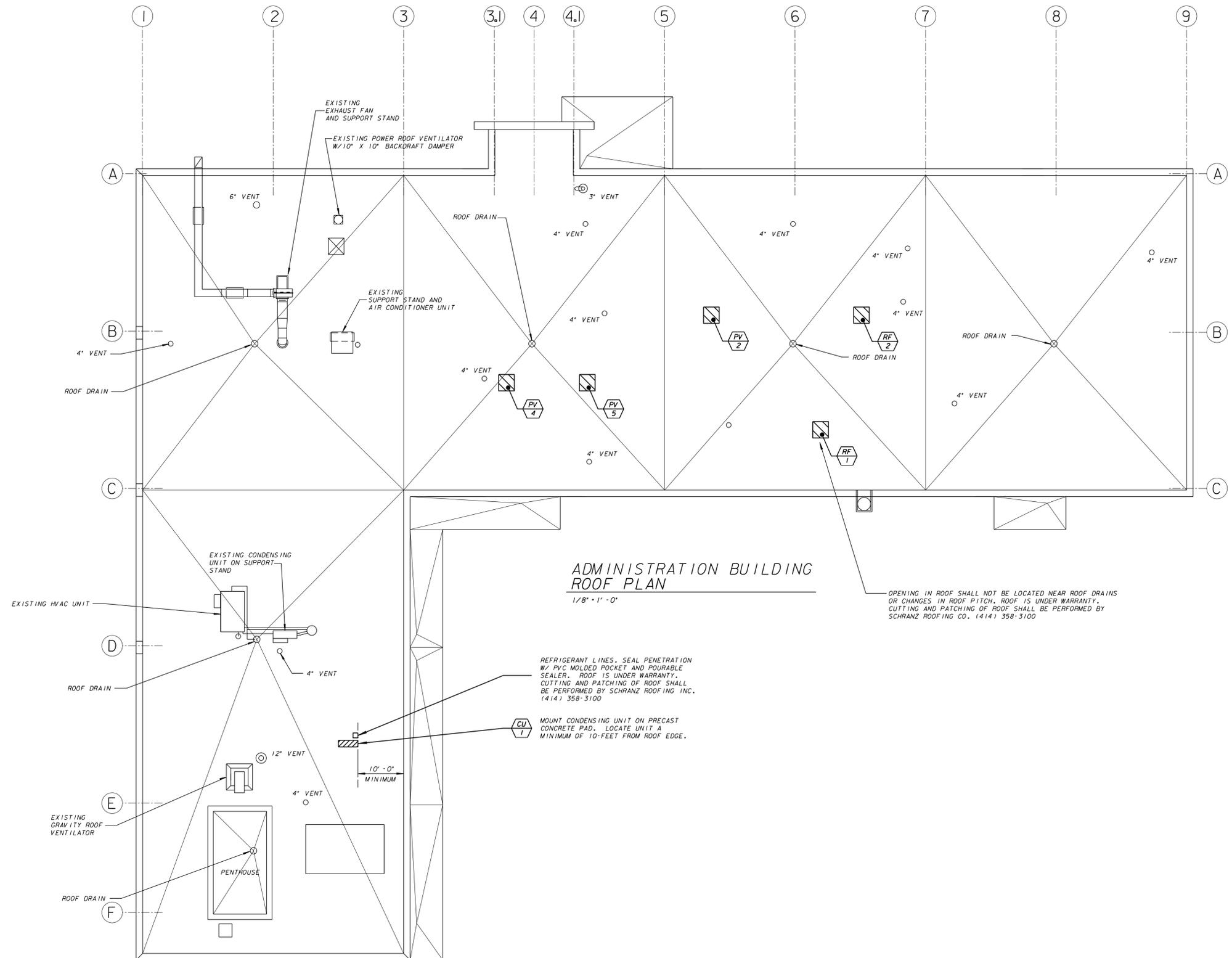
**PLAN OF AIR HANDLING UNIT 2
FOR SECOND FLOOR**
1/4" = 1' - 0"



DETAIL OF AIR HANDLING UNIT SUPPORT
NOT TO SCALE

Milwaukee Water Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
SECOND FLOOR PLAN - HVAC DUCTWORK			
DESIGNED BY	M.A.G.	PROVED	DATE
DRAWN BY	J.F.S.	<i>Richard Reynolds</i>	9-25-12
CHECKED BY	A.J.S.	<i>Daniel S. Hart</i>	PLANT'S PROJECT ENGINEER
DATE	4-25-12	<i>William</i>	9-25-12
SCALE	AS SHOWN		CHIEF DESIGN ENGINEER
WORK ORDER	WT450093300		9-25-12
OFFICIAL NOTICE	56-2012		SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS
FILE NO.	B-12-2		
DRAWING NO. HP-179-10			

NO.	BY	REVISION	DATE



ADMINISTRATION BUILDING
ROOF PLAN

1/8" = 1'-0"

REFRIGERANT LINES. SEAL PENETRATION
W/ PVC MOLDED POCKET AND POURABLE
SEALER. ROOF IS UNDER WARRANTY.
CUTTING AND PATCHING OF ROOF SHALL
BE PERFORMED BY SCHRANZ ROOFING INC.
(414) 358-3100

MOUNT CONDENSING UNIT ON PRECAST
CONCRETE PAD. LOCATE UNIT A
MINIMUM OF 10'-0" FROM ROOF EDGE.

OPENING IN ROOF SHALL NOT BE LOCATED NEAR ROOF DRAINS
OR CHANGES IN ROOF PITCH. ROOF IS UNDER WARRANTY.
CUTTING AND PATCHING OF ROOF SHALL BE PERFORMED BY
SCHRANZ ROOFING CO. (414) 358-3100



Milwaukee Water Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
ROOF PLAN - HVAC			
DESIGNED BY	M.A.G.	DATE	9-25-12
DRAWN BY	J.F.S.	PLANT PROJECT ENGINEER	
CHECKED BY	A.J.S.	DATE	9-25-12
DATE	4-25-12	CHIEF DESIGN ENGINEER	
SCALE	AS SHOWN	DATE	9-25-12
WORK ORDER	WT450093300	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
OFFICIAL NOTICE	56-2012		
FILE NO.	B-12-2		

NO.	BY	REVISION	DATE

DRAWING NO. **HP-179-11**

AIR HANDLING UNIT SCHEDULE																						
SYMBOL	MANUFACTURER	MODEL	HEATING COIL			COILING COIL			FAN			MOTOR										
			ROWS	FIN SPACING	STEAM (psig)	EDB/ LDB (°F)	(MBH)	ROWS	FIN SPACING	TURBULATORS	FLOW (GPM)	EFT/ LFT	EDB/ EWB (°F)	LDB/ LWB (°F)	SENS/ TOTAL (MBH)	SERVICE	C.F.M.	ESP. IN H2O	DISCHARGE	VOLTAGE	H.P.	R.P.M.
AHU-1	TRANE	CSIA010	1	69	2	45/95	220	6	92	YES	33	45/55	80.0/67.0	54.0/53.8	115.8/167.3	SUPPLY	4335	2.5	FRONT-TOP	200-208/3	5	1800
AHU-2	TRANE	CSIA010	1	79	2	45/95	404	6	130	NO	60	45/55	80.0/67.0	54.0/53.8	213.4/302.9	SUPPLY	7030	2.5	FRONT-BOTTOM	200-208/3	10	1800

AIR OUTLET AND INLET SCHEDULE											
SYMBOL	MANUFACTURER	MODEL	DESCRIPTION	SLOT QTY/WIDTH	MATERIAL	DIMENSIONS (IN.)	INLET SIZE	FINISH	SERVICE	MOUNTING	REMARKS
SD-1	TITUS	TBDI-30	PLENUM SLOT	2 / 3/4"	STEEL	24 LONG	8" OVAL		SUPPLY	T-BAR	(3) (4)
SD-2	TITUS	TBDI-30	PLENUM SLOT	4 / 3/4"	STEEL	48 LONG	8" OVAL		SUPPLY	T-BAR	(3) (4) (5)
SD-3	TITUS	300 FS	REGISTER 0' DEFL.	-	ALUMINUM	14x10		WHITE	SUPPLY	DUCT	(1)
SD-4	TITUS	300 FS	REGISTER 0' DEFL.	-	ALUMINUM	12x10		WHITE	SUPPLY	DUCT	(1)
RG-1	TITUS	PAR	PERFORATED GRILLE	-	STEEL	24x24	16-INCH	WHITE	RETURN	T-BAR	
RG-2	TITUS	PAR	PERFORATED GRILLE	-	STEEL	24x24	12-INCH	WHITE	RETURN	T-BAR	
RG-3	TITUS	300 FL	GRILLE 35' DEFL.	-	ALUMINUM	48x18		WHITE	RETURN	WALL	

(1) OPPOSED BLADE DAMPER
(2) EQUALIZING GRID
(3) TWO T-BARS OUTSIDE EDGE
(4) INLET DAMPER
(5) CROSS NOTCH

CONDENSING UNITS			
UNITS	CU-1	NOTES	
LOCATION	ROOF		
MANUFACTURER	PANASONIC		
MODEL	CU-2S18NB-U-1		
NOMINAL CAPACITY	TONS	1.5	
SEER		18	
EER		11.5	
POWER SUPPLY	V-Ph-Hz	208/230-1-60	
MAX. FUSE SIZE	A	25	
RUNNING AMPERE	A	6.9/7.6	
POWER INPUT	W	1450	
APPROX. WEIGHT	lbs.	152	

SPLIT-DUCTLESS CASSETTE UNITS			
UNITS	CA-1, CA-2	NOTES	
LOCATION	LIBRARY		
MANUFACTURER	PANASONIC		
MODEL	CS-MKS9NKKU		
NOMINAL CAPACITY	Btu/h	9000	
SUPPLY FAN			
AIR FLOW (H/MED/L)W	CFM	259/241/212	
HEAT INPUT	MBH	NA	
OUTPUT 1ST STAGE	MBH	NA	
OUTPUT 2ND STAGE	MBH	NA	
POWER SUPPLY	V-Ph-Hz	208/230-1-60	
RUNNING AMPERE	A	0.15/0.17	
POWER INPUT	W	35	
APPROX. WEIGHT	lbs.	20	

Notes:
(1) Provide condensation pump SI3100-1
(2) Provide wall-mounted wired remote controller CZRD115U
(3) Provide line set DL04060835

FAN SCHEDULE											
SYMBOL	MANUFACTURER	MODEL	SERVICE	LOCATION	AIRFLOW (cfm)	ESP (in. w.g.)	MOTOR (hp)	POWER SUPPLY (volts/phases)	DRIVE	WEIGHT (lb)	REMARKS
PV-2	GREENHECK	GB-091	EXHAUST	ROOF	750	0.20	1/4	115/60	BELT	61	(1) (2) (3) (4)
PV-4	GREENHECK	GB-091	EXHAUST	ROOF	875	0.25	1/4	115/60	BELT	61	(1) (2) (3) (4)
PV-5	GREENHECK	GB-081	EXHAUST	ROOF	500	0.25	1/6	115/60	BELT	60	(1) (2) (3) (4)
RF-1	GREENHECK	GB-121	RELIEF	ROOF	1300	0.25	1/4	115/60	BELT	66	(2) (3) (4) (5)
RF-2	GREENHECK	GB-131	RELIEF	ROOF	2200	0.125	1/2	115/60	BELT	67	(1) (2) (3) (4)

(1) PROVIDE CURB ADAPTER / REDUCER. WELDED GALVANIZED CONSTRUCTION.
(2) PROVIDE GRAVITY DAMPER
(3) PROVIDE CURB SEAL
(4) PROVIDE DISCONNECT SWITCH
(5) PROVIDE INSULATED ROOF CURB

FIN-TUBE SCHEDULE											
SYMBOL	MANUFACTURER	MODEL	STYLE	LENGTH (ft)	TUBE SIZE (inches)	FIN SIZE (inches)	FIN / FEET	ENCL. DEPTH & HEIGHT (inches)	MTG. HEIGHT (inches)	CAPACITY (BTU/HR)	REMARKS
FT-2	STERLING	VERSA-LINE	T	4	3/4	4-1/4 x 3-5/8	50	4-3/8 x 14	18	6.960	
FT-1	STERLING	VERSA-LINE	T	6	3/4	4-1/4 x 3-5/8	50	4-3/8 x 14	18	10.440	
FT-3, FT-4, FT-5	STERLING	VERSA-LINE	T	10	3/4	4-1/4 x 3-5/8	50	4-3/8 x 14	18	17.400	
FT-6	STERLING	VERSA-LINE	T	12	3/4	4-1/4 x 3-5/8	50	4-3/8 x 14	18	20.880	

LOUVER SCHEDULE												
SYMBOL	MANUFACTURER	MODEL	TYPE	MATERIAL	HEIGHT (in.)	WIDTH (in.)	DEPTH (in.)	FREE AREA (sq. ft.)	FINISH	SERVICE	ACCESSORIES	REMARKS
L-1	GREENHECK	ESJ-401	STATIONARY, EXTRUDED	ALUMINUM	72	60	4	16.20	CLEAR ANODIZE (> 0.7 mil)	INTAKE	(1) (2)	

(1) EXTENDED SILL
(2) INSECT SCREEN

PUMP SCHEDULE										
SYMBOL	MANUFACTURER	MODEL	TYPE	SERVICE	LOCATION	FLOW (GPM)	HEAD (ft.)	MOTOR (hp/phase)	POWER SUPPLY (volts/phases)	REMARKS
P-1, P-2	BELL + GOSSETT	1531-1 1/2 BC	END SUCTION	CHILLED WATER	BASEMENT	110	80	5/1750	208/3	(1)

(1) BRONZE FITTED

STEAM CONVECTOR SCHEDULE									
SYMBOL	MANUFACTURER	MODEL	TYPE	HEIGHT (in.)	LENGTH (in.)	DEPTH (in.)	CAPACITY (BTU/HR)	CFM	REMARKS
C-1	STERLING	432	FWG-A	32	36	4	6.480		
C-2, C-3, C-4	STERLING	432	SF-A	32	20	4	3.340		
C-5, C-6, C-18	STERLING	632	FWG-A	32	48	6	13.660		
C-7, C-17, C-20, C-21	STERLING	432	FWG-A	32	20	4	3.120		
C-8	STERLING	632	SF-A	32	28	6	8.330		
C-11	STERLING	632	SF-A	32	36	6	11.280		
C-12, C13	STERLING	632	FWG-A	32	20	6	4.850		
C-14	STERLING	632	SF-A	32	52	6	16.900		
C-19, C-15, C-16	STERLING	632	SF-A	32	52	6	16.900		

STEAM UNIT HEATER SCHEDULE									
SYMBOL	MANUFACTURER	MODEL	TYPE	MOTOR HP (watts)	AMPS	RPM	CAPACITY (BTU/HR)	CFM	REMARKS
UH-17, UH-18	STERLING	HS-24	HEADER	16	0.8	1350	21.600	380	(1)

(1) PROVIDE DISCONNECT SWITCH

VARIABLE-AIR-VOLUME TERMINAL UNITS										
SYMBOL	MANUFACTURER	MODEL	AIR VALVE SIZE (in.)	DESIGN AIRFLOW (cfm)	MINIMUM AIRFLOW (cfm)	REHEAT COIL			REMARKS	
						ELECTRIC HEAT (kW)	POWER (V-Ph)	FLA (A)		
VAV-1-1	TRANE	VariTrane VSEF	8	763	210	6.0	208-3	22.2	27.7	(1) FAN POWERED
VAV-1-2	TRANE	VariTrane VCEF	8	712	210	3.5	208-3	9.7	12.1	(1)
VAV-1-3	TRANE	VariTrane VCEF	8	500	150	2.5	208-3	6.9	8.7	(1)
VAV-1-4	TRANE	VariTrane VCEF	10	1203	360	5.5	208-3	15.3	19.1	(1)
VAV-1-5	TRANE	VariTrane VCEF	6	385	110	2.0	208-3	5.6	6.9	(1)
VAV-1-6	TRANE	VariTrane VCEF	8	813	240	3.5	208-3	9.7	12.1	(1)
VAV-2-1	TRANE	VariTrane VCEF	10	1009	300	4.5	208-3	12.5	15.6	(1)
VAV-2-2	TRANE	VariTrane VCEF	10	950	285	4.5	208-3	12.5	15.6	(1)
VAV-2-3	TRANE	VariTrane VCEF	6	497	150	2.5	208-3	6.9	8.7	(1)
VAV-2-4	TRANE	VariTrane VCEF	8	586	180	2.5	208-3	6.9	8.7	(1)
VAV-2-5	TRANE	VariTrane VCEF	6	495	150	2.5	208-3	6.9	8.7	(1)
VAV-2-6	TRANE	VariTrane VCEF	10	1193	400	5.5	208-3	15.3	19.1	(1)
VAV-2-7	TRANE	VariTrane VCEF	14	2231	700	10.0	208-3	27.8	34.7	(1)

(1) PROVIDE DISCONNECT SWITCH

WATER COOLED PACKAGE CHILLER SCHEDULE																				
SYMBOL	MANUFACTURER	MODEL	ELECTRICAL CHARACTERISTICS	EVAPORATOR PERFORMANCE				CONDENSER PERFORMANCE												
				EVAPORATOR FLUID	TEMP. IN (°F)	TEMP. OUT (°F)	FLOW (GPM)	CONDENSER FLUID	TEMP. IN (°F)	TEMP. OUT (°F)	CONDENSER FLOW PER CONDENSER (GPM)	TOTAL (GPM)	PRESSURE DROP (psi)	FL. WTR. (lbf)	BTU/HR (Tons)	COMP. POWER (kW)	FULL LOAD (TEER)			
CH-1	NAPPS	NWC40C	200/230-3-60	WATER	54.0	44.0	105.9	4.1	9.3	WATER	80.0	90.0	65.4	126.8	6.6	15.3	631,210	44.3	29.3	17.9

Milwaukee Water Works Water Engineering
Department of Public Works
HOWARD AVENUE PURIFICATION PLANT
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS
HP-179
SCHEDULES - HVAC

DESIGNED BY M.A.G. DATE 9-25-12
DRAWN BY J.F.S. PLANTS PROJECT ENGINEER
CHECKED BY A.J.S. DATE 9-25-12
DATE 4-25-12 CHIEF DESIGN ENGINEER
SCALE AS SHOWN
WORK ORDER WT450093300
OFFICIAL NOTICE 56-2012 SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS
DATE 9-25-12
DRAWING NO. HP-179-12

NO. BY REVISION DATE

VAV AHU WITH HYDRONIC HEATING/COOLING AND DRY BULB ECONOMIZER

Sequence of Operations: VAV AHU with Hydronic Heating/Cooling & Dry Bulb Economizer

Building Automation System Interface:
The Building Automation System (BAS) will send the controller Occupied, Unoccupied, Optimal Start, Night Heat / Cool and Timed Override commands. The BAS will also send a discharge air temperature setpoint and a duct static pressure setpoint. If communication is lost with the BAS, the controller will operate in the Occupied cooling mode using its default setpoints.

Occupied:
During Occupied periods the supply fan will run continuously and the outside air damper will open to maintain minimum ventilation requirements. All valves will modulate to maintain the discharge air temperature cooling setpoint (55°F adj). If the discharge air temperature sensor fails during normal operation all associated valves will close and an alarm will be annunciated.

Occupied (Daytime Warm-up):
During Occupied periods, when the space temperature is 1.5°F (adj) or more below the Occupied heating setpoint, a daytime warm-up sequence will be activated. The outside air damper will modulate to maintain minimum ventilation requirements, and the hot water valve will modulate to maintain the DAT heating setpoint (100°F adj). Mode will terminate when the average space temperature reaches the Occupied heating setpoint.

Unoccupied (Night Setback):
When the space temperature is below the Unoccupied heating setpoint (60°F adj) the supply fan will start, the outside air damper will remain closed and the hot water valve will open. When the space temperature rises above the Unoccupied heating setpoint (60°F adj) plus the Unoccupied differential (4°F adj) the supply fan will stop and the hot water valve will close.

When the space temperature is above the Unoccupied cooling setpoint (85°F adj) the supply fan will start, the outside air damper will remain closed and the chilled water valve will open. When the space temperature falls below the Unoccupied cooling setpoint (85°F adj) minus the Unoccupied differential (4°F adj) the supply fan will stop and the chilled water valve will close.

Morning Warm-up:
During optimal start, if the space temperature is 1.5°F (adj) or more below the Occupied heating setpoint, a morning warm-up sequence will be activated. The supply fan will start, the outside air damper will remain closed, and the hot water valve will modulate to maintain the DAT heating setpoint (100°F adj). Mode will terminate when the space temperature reaches the Occupied heating setpoint or the occupied time period has started.

Morning Cool-down:
During Optimal Start, if the space temperature is above the Occupied cooling setpoint, a morning cool down sequence will be activated. The supply fan will start and the chilled water valve will modulate to maintain the DAT cooling setpoint (55°F adj). The outside air damper will remain closed. Mode will terminate when the space temperature reaches the Occupied cooling setpoint or the occupied time period has started.

VAV Supply Fan:
The fan will be off in the Unoccupied mode. When the controller is in the Occupied mode, the supply fan will operate continuously and its speed will be modulated to maintain the duct static pressure setpoint. The duct static pressure setpoint is sent by the BAS and is reset between the minimum and maximum static pressure limits to maintain the "critical zone" VAV air damper in a position between 65% and 75% open.

If the supply fan fails to prove status for 30 seconds (adj), the fan will be commanded off, the outside air damper and all valves will close and an alarm will be annunciated. A manual reset is required to restart the fan. A hardwired, high static pressure cut-off switch is electrically interlocked with the variable speed drive. If the high static pressure cut-off switch is tripped the fan will stop, the outside air damper and all valves will close and an alarm will be annunciated. A manual reset of the high static pressure cut-off switch will be required to restart the fan.

Freeze Protection:
The initial damper opening rate will be limited to 2% per minute until the damper has reached its minimum ventilation position. The outside air damper will modulate to a position less than the minimum damper position if the mixed air temperature drops below 50°F (adj). If the mixed air temperature sensor fails the outside air damper will close and an alarm will be annunciated.

A hardwired, low limit temperature switch is electrically interlocked with the variable speed drive. If the low limit temperature switch is tripped (38°F adj), the outside air damper will close, all valves will open to 100% (adjust per climate) and an alarm will be annunciated. A manual reset of the low limit temperature switch will be required to restart the fan.

Filter Status:
A differential pressure switch will monitor the differential pressure across the filter when the fan is running. If the switch closes during normal operation a dirty filter alarm will be annunciated.

Economizer Damper Control:
When the outdoor air dry bulb conditions are favorable, the outdoor air damper and mechanical cooling will be controlled to maintain the discharge air temperature at setpoint. The chilled water cooling valve will be closed and the outdoor air damper will modulate between the minimum position and 100% open to allow outdoor air to be delivered for free cooling. If the outdoor air damper reaches 100% open and the discharge air temperature setpoint cannot be maintained using outdoor air alone, the outdoor air damper will be held 100% open and the chilled water valve will modulate to maintain the DAT cooling setpoint (55°F adj).

When the outdoor air dry bulb conditions are not favorable, the outdoor air damper will be controlled to minimum position and the chilled water valve will modulate to maintain the DAT cooling setpoint (55°F adj).

AH0032 - SYSTEM POINT LIST											
CONTROLLER: MP580	POINT TYPE							ALARMS			
	GRAPHIC	HARDWARE INPUT	HARDWARE OUTPUT	SOFTWARE POINT	DEFAULT VALUE	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
SYSTEM POINT DESCRIPTION											
VARIABLE VOLUME AIR HANDLER UNIT, WITH HYDRONIC HEATING/COOLING & DRY BULB ECONOMIZER											
SUPPLY FAN VFD START/STOP	X		BO								
SUPPLY FAN VFD SPEED	X		AO								
CHILLED WATER COIL VALVE	X		AO								
HOT WATER COIL VALVE	X		AO								
OUTSIDE AIR DAMPER	X		AO								
HEATING COIL DISCHARGE TEMPERATURE	X	AI				X	X			X	SENSOR FAILURE
MIXED AIR TEMPERATURE	X	AI				X	X			X	SENSOR FAILURE
DISCHARGE AIR TEMPERATURE	X	AI				X	X			X	SENSOR FAILURE
LOW LIMIT THERMOSTAT	X	BI						X	X		LOW LIMIT TEMPERATURE NOTE 6
HIGH STATIC PRESSURE CUT-OUT	X	BI						X	X		HIGH STATIC PRESSURE NOTE 6
SUPPLY FAN STATUS	X	BI						X	X		FAN FAILURE
FILTER STATUS	X	BI						X			DIRTY FILTER
DISCHARGE STATIC PRESSURE	X	AI				X	X			X	SENSOR FAILURE
SMOKE DETECTOR	X	BI							X		SMOKE ALARM
ZONE TEMPERATURE	X	AI									
BUILDING STATIC PRESSURE	X	AI									
OCCUPIED COOLING SETPOINT				X	74°F						
OCCUPIED HEATING SETPOINT				X	70°F						
OCCUPIED STANDBY COOLING SETPOINT				X	80°F						
OCCUPIED STANDBY HEATING SETPOINT				X	65°F						
UNOCCUPIED COOLING SETPOINT				X	85°F						
UNOCCUPIED HEATING SETPOINT				X	60°F						
OCCUPIED BYPASS TIMER				X	2.0 HRS						
MIXED AIR TEMPERATURE LOW LIMIT SETPOINT				X	50°F						
DISCHARGE AIR COOLING SETPOINT				X	55°F						
DISCHARGE AIR HEATING SETPOINT				X	100°F						
BAS COMMUNICATION STATE	X		X							X	NOTE 3
CONTROLLER SPARE HARDWARE POINTS											
UNIVERSAL INPUT(S)		1									NOTE 4 & 5
ANALOG OUTPUT(S)			2								NOTE 4
BINARY OUTPUT(S)				5							NOTE 4
GENERAL NOTES:	1. OPTIONAL FEATURE 2. CAN BE A COMMUNICATED VALUE 3. DISPLAYED AT THE BAS USER INTERFACE IF PRESENT 4. SPARE OR UNUSED POINTS 5. CONTROLLER WILL ACCEPT RTD SENSOR ON INPUTS 1-4 ONLY 6. DEVICE IS HARDWARE INTERLOCKED TO VFD, MANUAL RESET REQUIRED 7. DEVICE TO BE FURNISHED BY ELECTRICAL CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR										

CHILLED WATER ONLY - CONSTANT PRIMARY FLOW: (1) WATER COOLED CHILLER, TWO (2) CONSTANT FLOW MANIFOLD CHILLED WATER PUMPS

Sequence of Operation
Chilled Water Only - Constant Primary Flow: (1) Water Cooled Chiller, Two (2) Constant Flow Manifold Chilled Water Pumps

System General Description
The chilled water system consists of the following:
 • one (1) chiller
 • two (2) chilled water pumps: one (1) lead and one (1) lag

The chiller will have a factory mounted controller with a communication module to integrate into the Building Automation System (BAS). The BAS controller for the chilled water plant provides stand-alone control or control from a higher level BAS and provides lead/lag control for the chilled water pumps.

Chilled Water System Enable/Disable
The chilled water system is enabled on a contact closure from the system chiller. When enabled, the BAS controller starts the lead chilled water pump. When the chilled water system is disabled, the chilled water pump will be off.

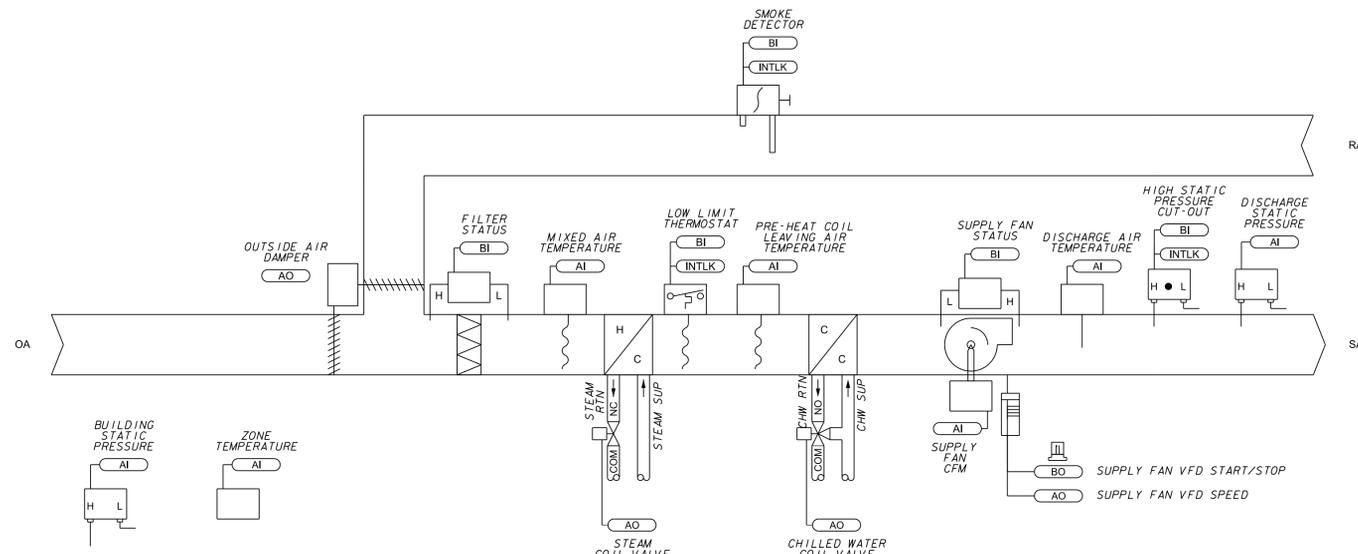
Chilled Water Pump Start/Stop
The BAS controller starts a chilled water pump through a contact closure of the pump's motor starter enable contacts.

Chilled Water Pump Status
The BAS controller detects chilled water pump run status by a current switch.

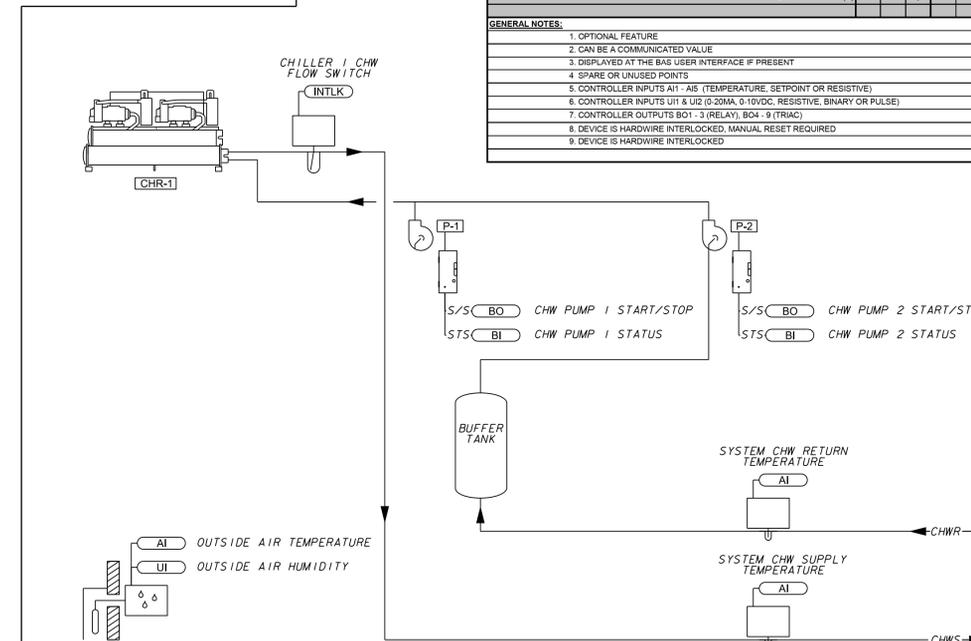
Chilled Water Pump Failure
If the lead start/stop relay is enabled and the current switch status is off for more than 30 seconds (adj.), the BAS controller announces a chilled water pump failure alarm to the BAS and starts the next pump in the sequence. Once the problem has been corrected, the operator is able to clear the alarm failure from the BAS controller from a BAS or by manually overriding the pump on momentarily. This will re-enable the lead/lag sequence.

Chilled Water Pump Lead/Lag
The chilled water pump lead/lag sequence is rotated on a weekly schedule. The sequence is based on calculated run time with the pump having the least run time as lead, the pump with the next lowest run time will be the second in the sequence and so on. From the BAS an operator is able to manually change the lead/lag sequence.

HY0045 - SYSTEM POINT LIST											
BACnet CONTROLLER: UC400	POINT TYPE							ALARMS			
	GRAPHIC	HARDWARE INPUT	HARDWARE OUTPUT	SOFTWARE POINT	DEFAULT VALUE	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
SYSTEM POINT DESCRIPTION											
Chilled Water Only - Constant Primary Flow: Cooled Chiller, Two (2) Constant Flow Manifold Chilled Water Pumps											
OA SENSOR	X	AI								X	DIAGNOSTICS
OUTSIDE AIR TEMPERATURE	X	AI									SENSOR FAILURE NOTE 1, 5
OUTSIDE AIR RELATIVE HUMIDITY	X	UI									SENSOR FAILURE NOTE 1, 6
CHILLED WATER PUMP 1 START/STOP	X		BO								NOTE 7
CHILLED WATER PUMP 2 START/STOP	X		BO								NOTE 7
CHILLED WATER SUPPLY TEMPERATURE	X	AI				AI	X	X		X	SENSOR FAILURE NOTE 5
CHILLED WATER RETURN TEMPERATURE	X	AI				AI	X	X		X	SENSOR FAILURE NOTE 5
CHILLED WATER PUMP 1 STATUS	X	BI							BI		PUMP FAILURE
CHILLED WATER PUMP 2 STATUS	X	BI							BI		PUMP FAILURE
CHILLER EVAPORATOR PROOF OF FLOW											NOTE 9
CHILLER PLANT ENABLE			X	OFF							
CHILLED WATER SUPPLY TEMPERATURE SETPOINT			X	42.55°F							
OUTSIDE AIR TEMPERATURE ENABLE SETPOINT			X	60°F							
BAS COMMUNICATION STATE			X							X	NOTE 3
CONTROLLER SPARE HARDWARE POINTS											
UNIVERSAL INPUT(S)		1									NOTE 4 & 6
ANALOG INPUT(S)			2								NOTE 4 & 5
ANALOG OUTPUT(S)				2							NOTE 4
BINARY INPUT(S)				1							NOTE 4
BINARY OUTPUT(S)					7						NOTE 4
GENERAL NOTES:	1. OPTIONAL FEATURE 2. CAN BE A COMMUNICATED VALUE 3. DISPLAYED AT THE BAS USER INTERFACE IF PRESENT 4. SPARE OR UNUSED POINTS 5. CONTROLLER INPUTS AI1 - AI5 (TEMPERATURE, SETPOINT OR RESISTIVE) 6. CONTROLLER INPUTS UI1 & UI2 (0-20MA, 0-10VDC, RESISTIVE, BINARY OR PULSE) 7. CONTROLLER OUTPUTS BO1 - 3 (RELAY), BO4 - 9 (TRIAC) 8. DEVICE IS HARDWARE INTERLOCKED, MANUAL RESET REQUIRED 9. DEVICE IS HARDWARE INTERLOCKED										



VAV AHU WITH STEAM HEATING/COOLING



CHILLED WATER SYSTEM CONSTANT PRIMARY FLOW
1 CHILLER
2 CHILLED WATER MANIFOLD PUMPS

NO.	BY	REVISION	DATE

Milwaukee Water Works Water Engineering
 Department of Public Works
HOWARD AVENUE PURIFICATION PLANT
 ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS
 HP-179
 HVAC CONTROLS

DESIGNED BY	M.A.G.	DATE	9-25-12
DRAWN BY	J.F.S.	PLANT'S PROJECT ENGINEER	
CHECKED BY	A.J.S.	DATE	4-25-12
SCALE	AS SHOWN	CHIEF DESIGN ENGINEER	
WORK ORDER	WT450093300	DATE	9-25-12
OFFICIAL NOTICE	56-2012	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
FILE NO.	B-12-2	DRAWING NO.	HP-179-13

**VAV BOX - FAN POWERED SERIES,
SCR ELECTRIC HEAT**

Sequence of Operations:
VAV Box - Fan Powered Series, SCR Electric Heat

Building Automation System Interface:

The Building Automation System (BAS) will send the controller Occupied and Unoccupied commands. The BAS may also send a Heat/Cool mode, priority shutdown commands, space temperature and/or space temperature setpoint. If a BAS is not present, or communication is lost with the BAS, the controller will operate using its local setpoints.

Heat/Cool Mode:

The Heat/Cool mode will be set by a communicated value or automatically by the VAV. In standalone or auto mode the VAV will compare the primary air temperature with the configured auto changeover setpoint to determine if the air is "hot" or "cold". Heating mode will command the VAV to heat only; it implies the primary air temperature is hot. Cooling mode commands the VAV to cool only; it implies the primary air temperature is cold.

Heat/Cool Setpoint:

The space temperature setpoint will be determined either by a local hardwired setpoint, the VAV default setpoint or a communicated value. The VAV uses the locally stored default setpoints when neither a local hardwired setpoint nor communicated setpoint is present. If both a hardwired setpoint and communicated setpoint exist, the VAV will use the communicated value.

Occupancy Mode:

The occupancy mode can be communicated or hardwired to the VAV via a binary input. Valid Occupancy modes for the VAV will be:

Occupied:

Normal operating mode for occupied spaces or daytime operation. When the unit is in the occupied mode the VAV will maintain the space temperature at the active occupied heating or cooling setpoint. Applicable ventilation and airflow setpoints will be enforced. The occupied mode will be the default mode of the VAV.

Unoccupied:

Normal operating mode for unoccupied spaces or nighttime operation. When the unit is in unoccupied mode the VAV will maintain the space temperature at the stored unoccupied heating or cooling setpoint regardless of the presence of a hardwired or communicated setpoint. When the space temperature exceeds the active unoccupied setpoint the VAV will modulate fully closed.

Occupied Bypass:

Mode used to temporarily place the unit into the occupied operation. Tenants will be able to override the unoccupied mode from the space sensor. The override will last for a maximum of 4 hours (configurable). The tenants will be able to cancel the override from the space sensor at any time. During the override the unit will run in occupied mode.

Cooling Mode:

When the unit is in cooling mode, the VAV will maintain the space temperature at the active cooling setpoint by modulating the airflow between the active cooling minimum airflow setpoint to the maximum cooling airflow setpoint. Based on the VAV occupancy mode, the active cooling setpoint will be one of the following:

Setpoint	Default Value
Occupied Cooling Setpoint	74°F
Unoccupied Cooling Setpoint	85°F
Occupied Standby Cooling Setpoint	78°F
Occupied Min Cooling Airflow Setpoint	See VAV Schedule
Occupied Max Cooling Airflow Setpoint	See VAV Schedule

The VAV will use the measured space temperature and the active cooling setpoint to determine the requested cooling capacity of the unit. The outputs will be controlled based on the unit configuration and the requested cooling capacity.

Heating Mode:

When the unit is in heating mode, the CONTROLLER will maintain the space temperature at the active heating setpoint by modulating the airflow between the active heating minimum airflow setpoint to the maximum heating airflow setpoint. Based on the CONTROLLER occupancy mode, the active heating setpoint will be one of the following:

Setpoint	Default Value
Occupied Heating Setpoint	71°F
Unoccupied Heating Setpoint	60°F
Occupied Standby Heating Setpoint	67°F
Occupied Min Heating Airflow Setpoint	See VAV Schedule
Occupied Max Heating Airflow Setpoint	See VAV Schedule

The controller will use the measured space temperature and the active heating setpoint to determine the requested heating capacity of the unit. The outputs will be controlled based on the unit configuration and the requested heating capacity.

Continuous Fan Control:

The VAV fan will operate continuously in all occupied modes. During the unoccupied mode, the primary air valve will modulate fully closed. The terminal fan and heat will cycle as needed to maintain a reduced space temperature.

Reheat Control:

Reheat will only be allowed when the primary air temperature is 5°F below the configured reheat enable setpoint, (70°F adjustable). The reheat will be enabled when the space temperature drops below the active heating setpoint and the airflow is in the minimum heating airflow setpoint. During reheat the VAV will operate at its minimum heating airflow setpoint and energize the heat as follows:

SCR Modulated Electric Reheat:

If the space temperature is at the heating setpoint, the electric heat will modulate from 0-100% based on deviation from setpoint.

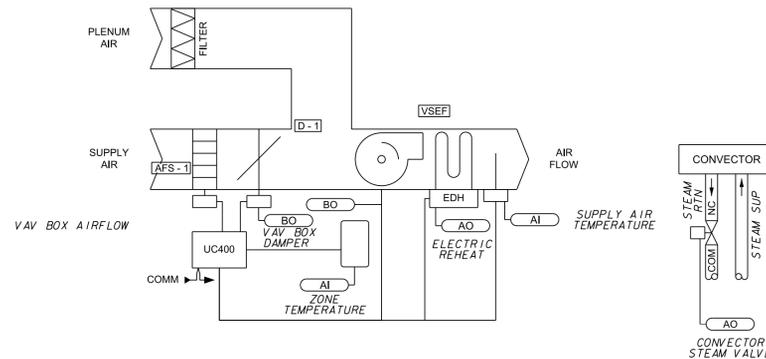
Baseboard Steam Heating Valve Control:

If the space temperature is at the heating setpoint, the baseboard steam heating valve will modulate from 0-100% based on deviation from setpoint.

The Building Automation System (BAS) will send the controller a signal that determines which heating source listed above will be used as the first stage of heating. If steam is available, the controller will use the baseboard steam heating valve as the first stage of heating. The second stage of heating will be energized based on time and temperature deviation from setpoint. If steam is not available, the controller will use the SCR modulated electric reheat on the VAV for heating. The controller will default to the SCR modulated electric reheat if the signal from the Building Automation System (BAS) is lost.

Space Sensor Failure:

If there is a fault with the operation of the zone sensor, it will be feed back to the BAS. Zone sensor failure will cause the VAV to drive the damper to minimum air flow if the VAV is in the occupied mode, or drive it closed if the VAV is in the unoccupied mode. If a series fan is available, it will be enabled, and the reheat will be disabled.



VAV BOX - FAN POWERED SERIES, ELECTRIC HEAT

**VAV BOX - SINGLE DUCT,
SCR ELECTRIC HEAT**

Sequence of Operations:
VAV Box - Single Duct, SCR Electric Heat

Building Automation System Interface:

The Building Automation System (BAS) will send the controller Occupied and Unoccupied commands. The BAS may also send a Heat/Cool mode, priority shutdown commands, space temperature and/or space temperature setpoint. If a BAS is not present, or communication is lost with the BAS, the controller will operate using its local setpoints.

Heat/Cool Mode:

The Heat/Cool mode will be set by a communicated value or automatically by the VAV. In standalone or auto mode the VAV will compare the primary air temperature with the configured auto changeover setpoint to determine if the air is "hot" or "cold". Heating mode will command the VAV to heat only; it implies the primary air temperature is hot. Cooling mode commands the VAV to cool only; it implies the primary air temperature is cold.

Heat/Cool Setpoint:

The space temperature setpoint will be determined either by a local hardwired setpoint, the VAV default setpoint or a communicated value. The VAV uses the locally stored default setpoints when neither a local hardwired setpoint nor communicated setpoint is present. If both a hardwired setpoint and communicated setpoint exist, the VAV will use the communicated value.

Occupancy Mode:

The occupancy mode can be communicated or hardwired to the VAV via a binary input. Valid Occupancy modes for the VAV will be:

Occupied:

Normal operating mode for occupied spaces or daytime operation. When the unit is in the occupied mode the VAV will maintain the space temperature at the active occupied heating or cooling setpoint. Applicable ventilation and airflow setpoints will be enforced. The occupied mode will be the default mode of the VAV.

Unoccupied:

Normal operating mode for unoccupied spaces or nighttime operation. When the unit is in unoccupied mode the VAV will maintain the space temperature at the stored unoccupied heating or cooling setpoint regardless of the presence of a hardwired or communicated setpoint. When the space temperature exceeds the active unoccupied setpoint the VAV will modulate fully closed.

Occupied Bypass:

Mode used to temporarily place the unit into the occupied operation. Tenants will be able to override the unoccupied mode from the space sensor. The override will last for a maximum of 4 hours (configurable). The tenants will be able to cancel the override from the space sensor at any time. During the override the unit will run in occupied mode.

Cooling Mode:

When the unit is in cooling mode, the VAV will maintain the space temperature at the active cooling setpoint by modulating the airflow between the active cooling minimum airflow setpoint to the maximum cooling airflow setpoint. Based on the VAV occupancy mode, the active cooling setpoint will be one of the following:

Setpoint	Default Value
Occupied Cooling Setpoint	74°F
Unoccupied Cooling Setpoint	85°F
Occupied Standby Cooling Setpoint	78°F
Occupied Min Cooling Airflow Setpoint	See VAV Schedule
Occupied Max Cooling Airflow Setpoint	See VAV Schedule

The VAV will use the measured space temperature and the active cooling setpoint to determine the requested cooling capacity of the unit. The outputs will be controlled based on the unit configuration and the requested cooling capacity.

Heating Mode:

When the unit is in heating mode, the controller will maintain the space temperature at the active heating setpoint by modulating the airflow between the active heating minimum airflow setpoint to the maximum heating airflow setpoint. Based on the controller occupancy mode, the active heating setpoint will be one of the following:

Setpoint	Default Value
Occupied Heating Setpoint	71°F
Unoccupied Heating Setpoint	60°F
Occupied Standby Heating Setpoint	67°F
Occupied Min Heating Airflow Setpoint	See VAV Schedule
Occupied Max Heating Airflow Setpoint	See VAV Schedule

The controller will use the measured space temperature and the active heating setpoint to determine the requested heating capacity of the unit. The outputs will be controlled based on the unit configuration and the requested heating capacity.

Reheat Control:

Reheat will only be allowed when the primary air temperature is 5°F below the configured reheat enable setpoint, (70°F adjustable). The reheat will be enabled when the space temperature drops below the active heating setpoint and the airflow is in the minimum heating airflow setpoint. During reheat the VAV will operate at its minimum heating airflow setpoint and energize the heat as follows:

SCR Modulated Electric Reheat:

If the space temperature is at the heating setpoint, the electric heat will modulate from 0-100% based on deviation from setpoint.

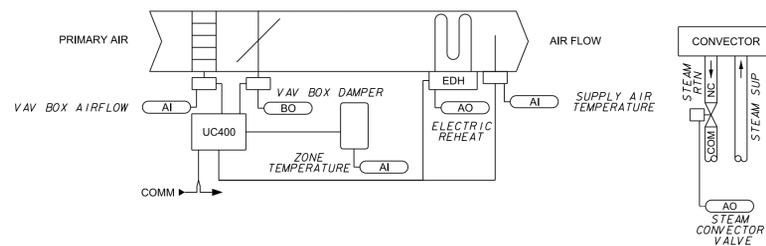
Baseboard Steam Heating Valve Control:

If the space temperature is at the heating setpoint, the baseboard steam heating valve will modulate from 0-100% based on deviation from setpoint.

The Building Automation System (BAS) will send the controller a signal that determines which heating source listed above will be used as the first stage of heating. If steam is available, the controller will use the baseboard steam heating valve as the first stage of heating. The second stage of heating will be energized based on time and temperature deviation from setpoint. If steam is not available, the controller will use the SCR modulated electric reheat on the VAV for heating. The controller will default to the SCR modulated electric reheat if the signal from the Building Automation System (BAS) is lost.

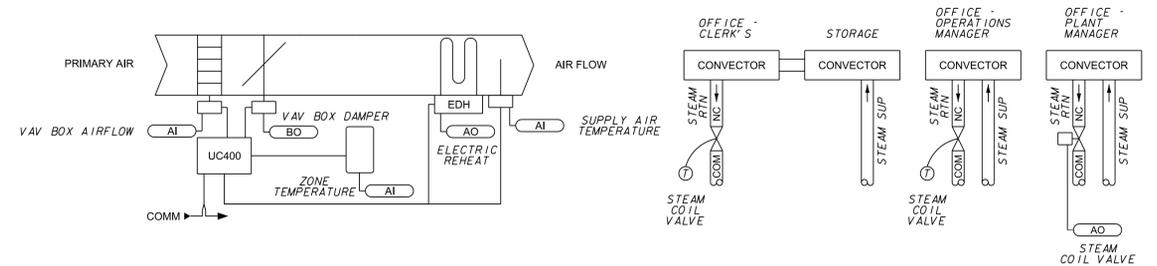
Space Sensor Failure:

If there is a fault with the operation of the zone sensor, it will be feed back to the BAS. Zone sensor failure will cause the VAV to drive the damper to minimum air flow if the VAV is in the occupied mode, or drive it closed if the VAV is in the unoccupied mode.



VAV BOX - SINGLE DUCT, ELECTRIC HEAT

TS0050 - SYSTEM POINT LIST														
CONTROLLER: UC400		POINT TYPE				ALARMS								
SYSTEM POINT DESCRIPTION														
VAV BOX TERMINAL UNIT - FAN POWERED SERIES, ELECTRIC HEAT														
		GRAPHIC	HARDWARE INPUT	HARDWARE OUTPUT	SOFTWARE POINT	DEFAULT VALUE	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL	DIAGNOSTIC	NOTES
ZONE SENSOR	ZONE TEMPERATURE (THERM)	X	AI				X	X			X			SENSOR FAILURE
	ZONE TEMPERATURE SETPOINT		AI								X			SENSOR FAILURE
	ON/CANCEL													NOTE 1
	VAV BOX AIRFLOW	X	AI								X			SENSOR FAILURE
	VAV BOX DAMPER	X	BO											NOTE 5
	SUPPLY AIR TEMPERATURE SENSOR (THERM)	X	AI				X	X			X			SENSOR FAILURE
	ELECTRIC REHEAT (SCR)	X	AO											
	BASEBOARD HEATING	X	AO											
	VAV BOX SERIES FAN	X	BO											
	OCUPIED COOLING SETPOINT				X	74°F	X	X						
	OCUPIED HEATING SETPOINT				X	71°F	X	X						
	OCUPIED STANDBY COOLING SETPOINT				X	78°F	X	X						NOTE 1.7
	OCUPIED STANDBY HEATING SETPOINT				X	67°F	X	X						
	UNOCUPIED COOLING SETPOINT				X	85°F								
	UNOCUPIED HEATING SETPOINT				X	60°F								
	MINIMUM COOLING AIRFLOW SETPOINT				X									NOTE 6
	MAXIMUM COOLING AIRFLOW SETPOINT				X									NOTE 6
	MINIMUM HEATING AIRFLOW SETPOINT				X									NOTE 6
	MAXIMUM HEATING AIRFLOW SETPOINT				X									NOTE 6
	OCUPIED BYPASS TIMER				X	2.0 HRS								
	BAS COMMUNICATION STATE				X						X			NOTE 3
CONTROLLER SPARE HARDWARE POINTS														
	ANALOG INPUT(S)		2											NOTE 4
	UNIVERSAL INPUT(S)		2											NOTE 4
	BINARY INPUT(S)		3											NOTE 4
	ANALOG OUTPUT(S)/BINARY INPUT(S)													NOTE 4.8
	BINARY OUTPUT(S)		4											NOTE 4
GENERAL NOTES:														
1. OPTIONAL FEATURE														
2. AVAILABLE WHEN NO OCCUPANCY SENSOR IS PRESENT														
3. DISPLAYED AT THE BAS USER INTERFACE IF PRESENT														
4. SPARE OR UNUSED POINTS														
5. TRIAC OUTPUT														
6. SEE VAV SCHEDULE FOR VALUES														
7. REQUIRES OCCUPANCY SENSOR														
8. POINT IS CONFIGURABLE AS EITHER ANALOG OUTPUT OR BINARY INPUT														

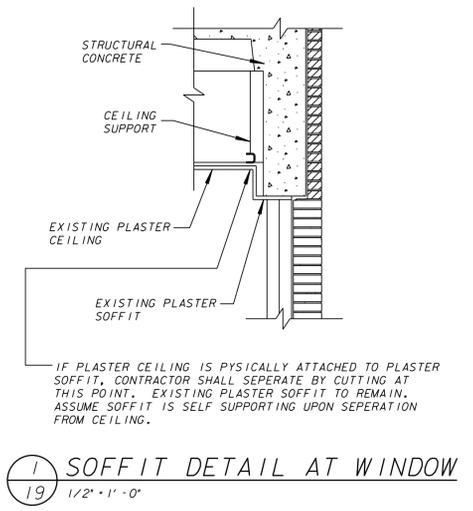
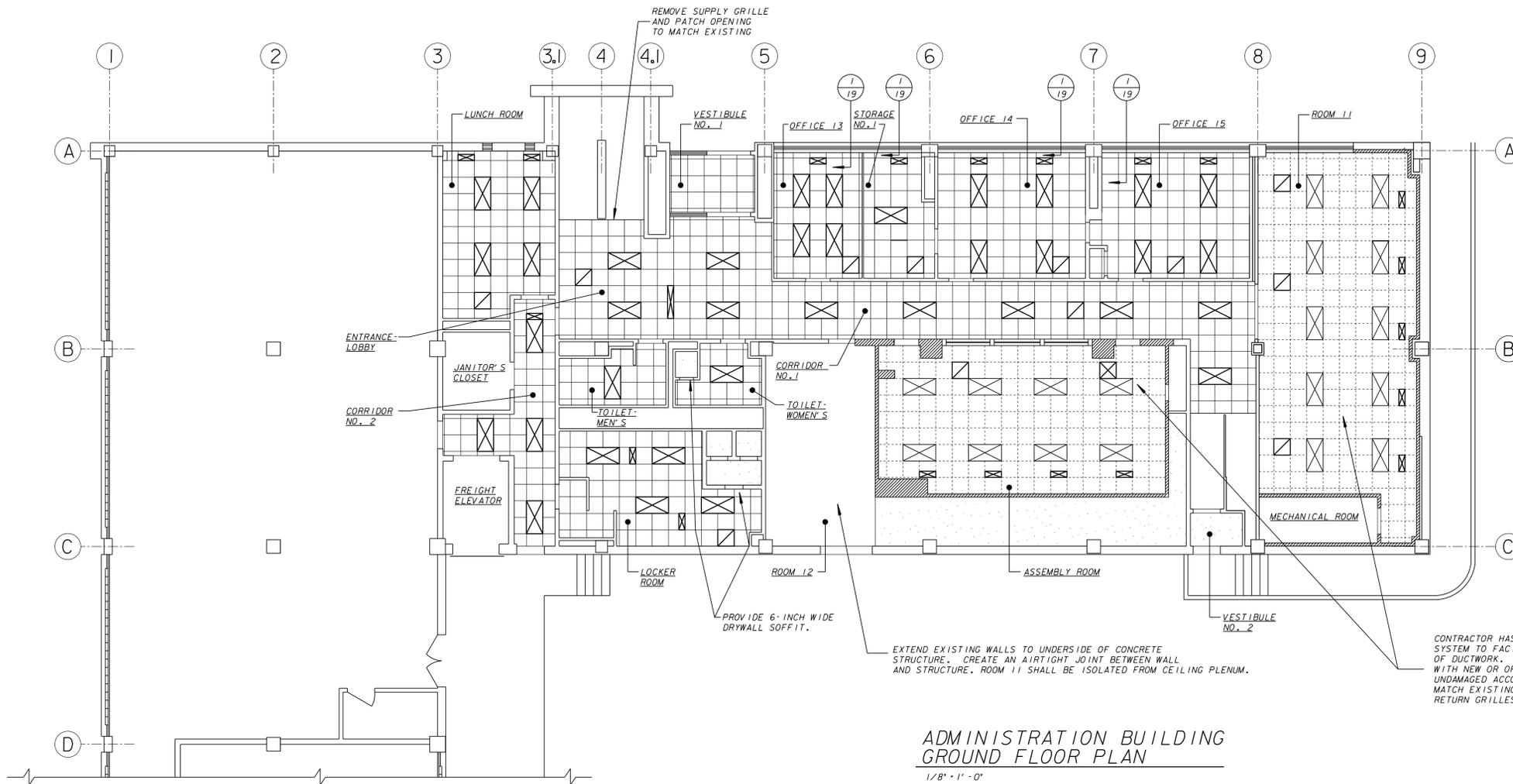


VAV BOX-1-2 - SINGLE DUCT, ELECTRIC HEAT

NOTE
TIE PERIMETER RADIATION TO VAV-1-2.
EACH PERIMETER RADIATION ZONE TO
HAVE INDIVIDUAL CONTROL.

Milwaukee Water Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
HVAC CONTROLS			
DESIGNED BY	M.A.G.	DATE	9-25-12
DRAWN BY	J.F.S.	PLANT'S PROJECT ENGINEER	
CHECKED BY	A.J.S.	DATE	4-25-12
SCALE	AS SHOWN	CHIEF DESIGN ENGINEER	
WORK ORDER	WT450093300	DATE	9-25-12
OFFICIAL NOTICE	56-2012	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
FILE NO.	B-12-2	DRAWING NO.	HP-179-14

NO.	BY	REVISION	DATE



ADMINISTRATION BUILDING
GROUND FLOOR PLAN
1/8" = 1' - 0"

LEGEND: (SHEETS HP-179-19 & HP-179-20)

-  2' x 4' ACOUSTIC TILE CEILING AND SUSPENDED GRID SYSTEM
-  EXISTING LAY-IN 2' x 2' ACOUSTIC TILE CEILING AND SUSPENDED GRID SYSTEM
-  EXISTING PLASTER CEILING TO REMAIN
-  NO CEILING, EXPOSED CONSTRUCTION
-  SUPPLY DIFFUSER
-  RETURN GRILLE

NOTES - GENERAL

1. HEIGHT OF NEW ACOUSTIC TILE CEILING AND SUSPENDED GRID SYSTEM SHALL BE AT THE SAME HEIGHT AS THE ORIGINAL PLASTER CEILING. ORIGINAL PLASTER CEILING HEIGHT IS APPROXIMATELY 8'-7"

CONTRACTOR HAS THE OPTION TO REMOVE THE CEILING SYSTEM TO FACILITATE THE DEMOLITION AND INSTALLATION OF DUCTWORK. CEILING SYSTEM SHALL THEN BE REPLACED WITH NEW OR ORIGINAL UNDAMAGED T-BARS. REUSE ORIGINAL UNDAMAGED ACCOUSTICAL TILES. PROVIDE NEW TILES TO MATCH EXISTING WHERE 2x2 CEILING DIFFUSERS AND 2x2 RETURN GRILLES WERE REMOVED DURING DEMOLITION.

NO.	BY	REVISION	DATE

Milwaukee Water Engineering
Department of Public Works

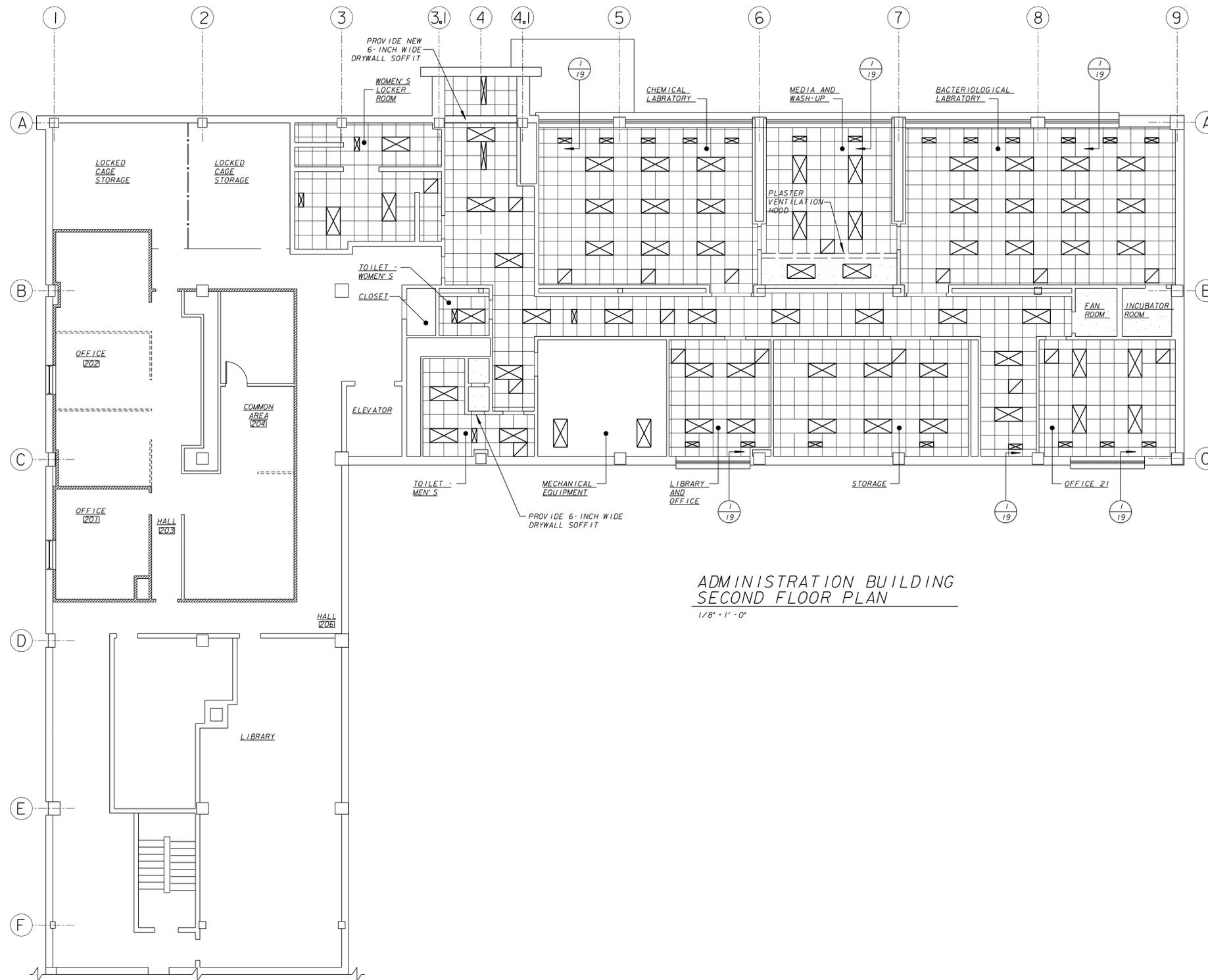
HOWARD AVENUE PURIFICATION PLANT

ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS
HP-179

GROUND FLOOR ARCHITECTURAL CEILING PLAN

DESIGNED BY	M.A.G.	DATE	9-25-12
DRAWN BY	J.F.S.	PLANTS PROJECT ENGINEER	
CHECKED BY	A.J.S.	DATE	9-25-12
DATE	4-25-12	CHIEF DESIGN ENGINEER	
SCALE	AS SHOWN		
WORK ORDER	WT450093300		
OFFICIAL NOTICE	56-2012		
FILE NO.	B-12-2		

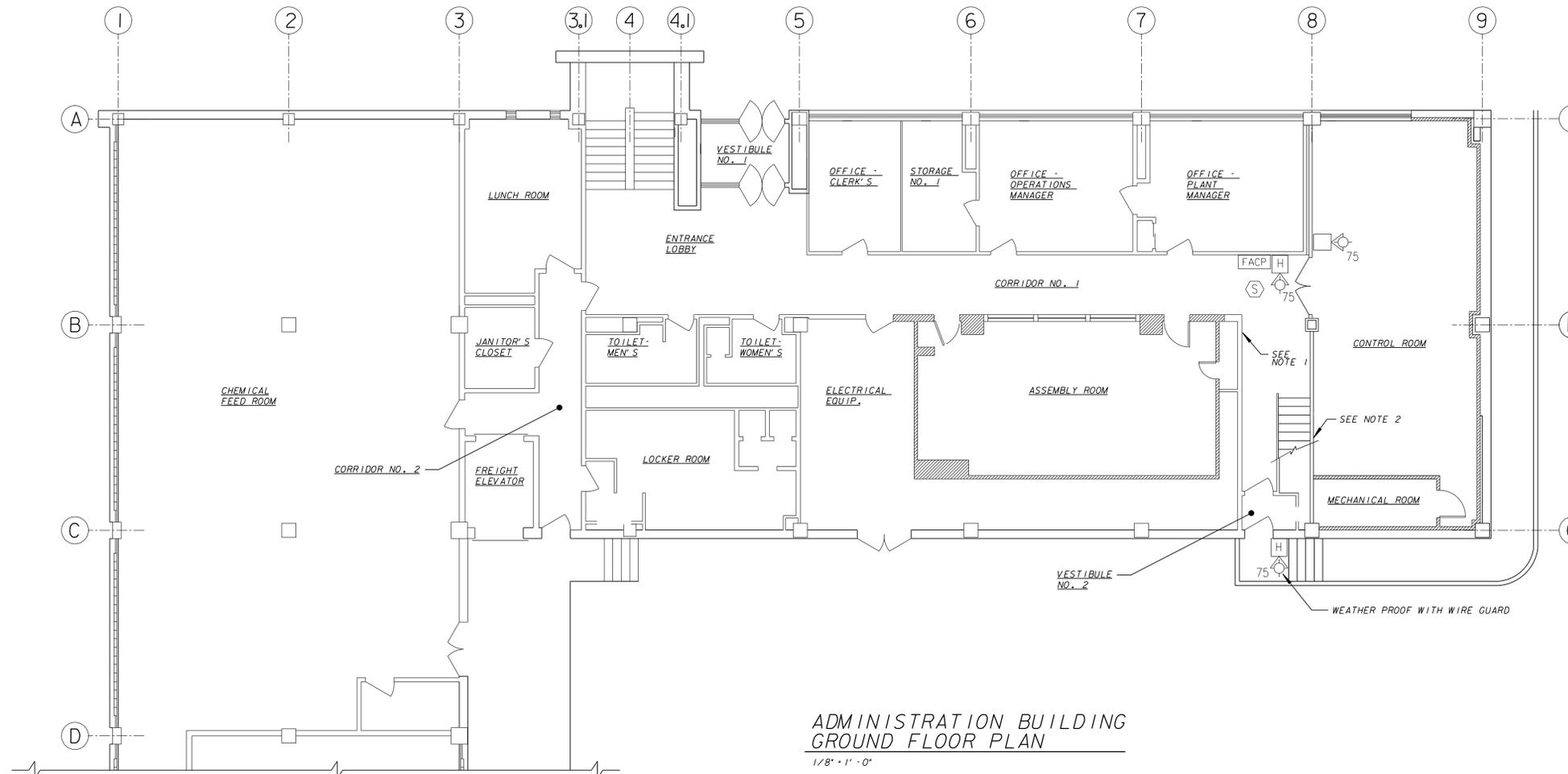
DRAWING NO. **HP-179-16**



ADMINISTRATION BUILDING
SECOND FLOOR PLAN
1/8" = 1' - 0"

Milwaukee Water Works Department of Public Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
SECOND FLOOR ARCHITECTURAL CEILING PLAN			
DESIGNED BY	M.A.G.	APPROVED	DATE
DRAWN BY	J.F.S.	<i>Andrew Reynolds</i>	9-25-12
CHECKED BY	A.J.S.	<i>Daniel G. Hart</i>	PLANTS PROJECT ENGINEER
DATE	5-8-12	<i>William</i>	9-25-12
SCALE	AS SHOWN		CHIEF DESIGN ENGINEER
WORK ORDER	WT450093300		9-25-12
OFFICIAL NOTICE	56-2012		SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS
FILE NO.	B-12-2	DRAWING NO. HP-179-17	

NO.	BY	REVISION	DATE



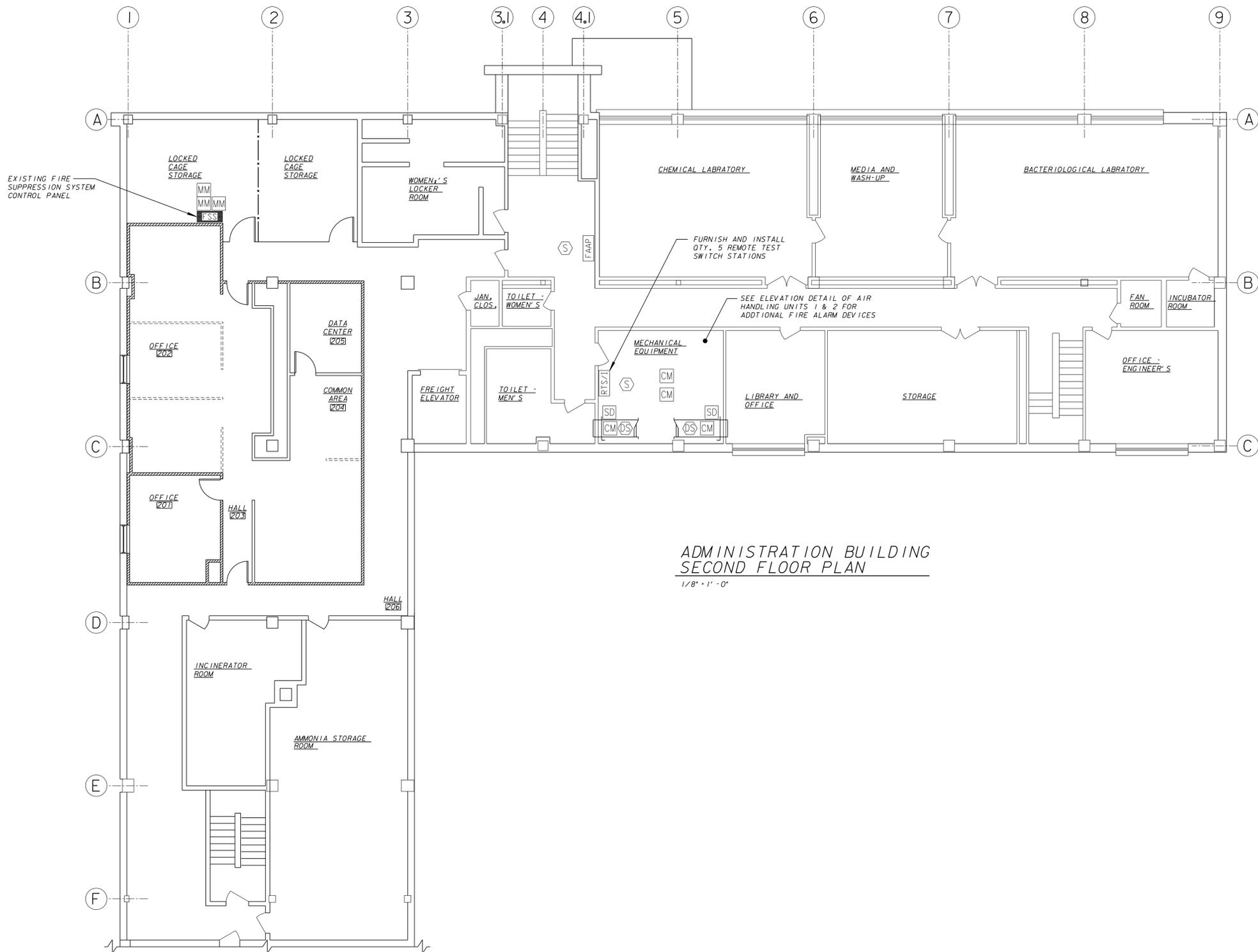
ADMINISTRATION BUILDING
GROUND FLOOR PLAN
1/8" = 1' - 0"

- FIRE ALARM SYMBOLS**
- [FACP] NEW FIRE ALARM CONTROL PANEL
 - [FAAP] NEW FIRE ALARM ANNUNCIATOR PANEL
 - [H] 75 NEW FIRE ALARM HORN/STROBE CANDELA RATING AS INDICATED
 - [H] 75 NEW FIRE ALARM STROBE CANDELA RATING AS INDICATED
 - [S] NEW INTELLIGENT PHOTOELECTRIC SMOKE DETECTOR
 - [DS] NEW INTELLIGENT PHOTOELECTRIC DUCT SMOKE DETECTOR
 - [MM] NEW MONITOR MODULE
 - [CM] NEW CONTROL MODULE
 - [FSS] EXISTING FIRE SUPPRESSION SYSTEM
 - [R] NEW FAN SHUTDOWN RELAY
 - [SD] NEW SMOKE DAMPER
 - [RTS/I] REMOTE TEST SWITCH WITH INDICATOR

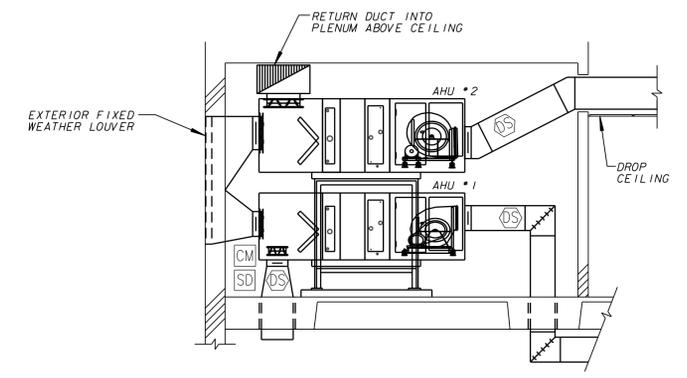
- NOTES:**
- 1 USE SPARE 20A 1P CIRCUIT BREAKER IN EXISTING PANEL TO FEED NEW FACP
 - 2 MOUNT NEW FIRE ALARM LED DISPLAY AT THIS LOCATION TO MATCH FLAT PANEL MOUNTING HEIGHT. PLUG INTO EXISTING 120V RECEPTACLE.

Milwaukee Water Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
GROUND FLOOR PLAN - FIRE ALARM			
DESIGNED BY	A.A.	APPROVED	DATE
DRAWN BY	J.F.S.	<i>Andrew Reynolds</i>	9-25-12
CHECKED BY	A.J.S.	PLANT'S PROJECT ENGINEER	
DATE	4-25-12	<i>Daniel G. Hart</i>	9-25-12
SCALE	AS SHOWN	<i>Andrew Reynolds</i>	9-25-12
WORK ORDER	WT450093300	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
OFFICIAL NOTICE	56-2012		
FILE NO.	B-12-2	DRAWING NO. HP-179-18	

NO.	BY	REVISION	DATE



ADMINISTRATION BUILDING
SECOND FLOOR PLAN
1/8" = 1' - 0"



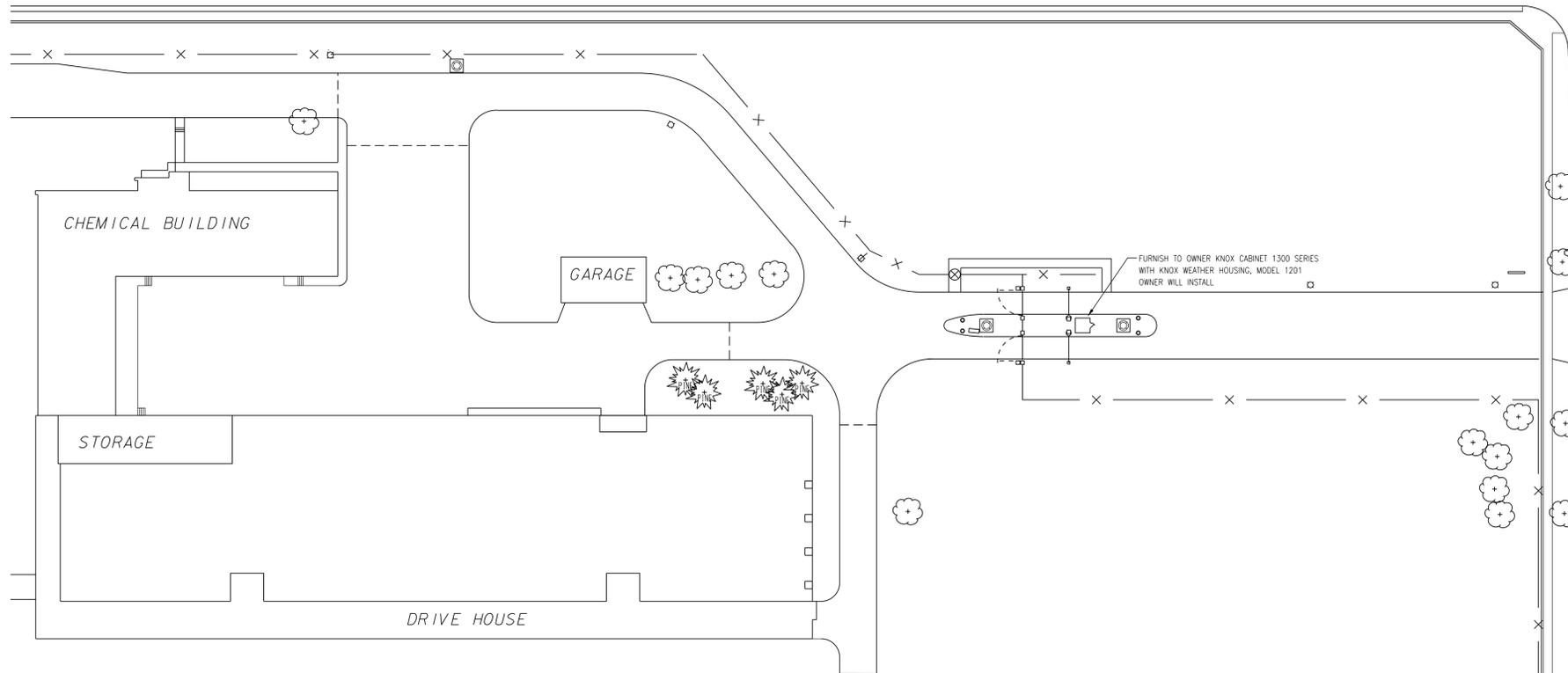
ELEVATION OF AIR HANDLING UNITS 1 & 2
NOT TO SCALE

NO.	BY	REVISION	DATE

Milwaukee Water Works Department of Public Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
SECOND FLOOR PLAN - FIRE ALARM			
DESIGNED BY	A.A.	APPROVED	DATE
DRAWN BY	J.F.S.	<i>Andrew Reynolds</i>	9-25-12
CHECKED BY	A.J.S.	<i>Daniel G. Hart</i>	9-25-12
DATE	5-8-12	<i>William</i>	9-25-12
SCALE	AS SHOWN	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
WORK ORDER	WT450093300	DRAWING NO. HP-179-19	
OFFICIAL NOTICE	56-2012		
FILE NO.	B-12-2		

W. HOWARD AVE.

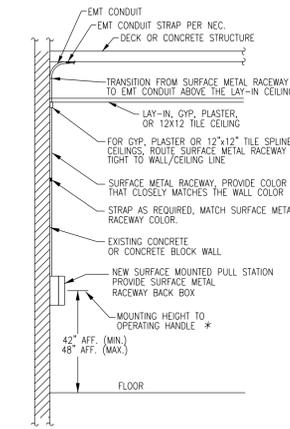
S. 6TH ST.



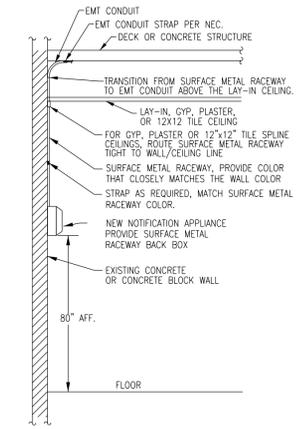
FIRE ALARM SITE PLAN
1" = 40'

Fire Alarm Symbols

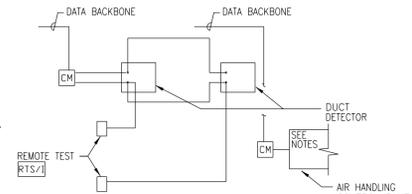
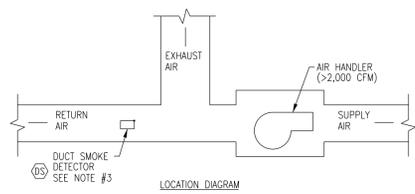
[FACP]	New Fire Alarm Control Panel
[EAP]	Existing Fire Alarm Panel
[FAAP]	New Fire Alarm Annunciator Panel
[AAP]	Existing Fire Alarm Annunciator Panel
[P]	New Fire Alarm Pull Station
[H]	New Fire Alarm Horn/Strobe, (w) is Candela Rating
[S]	New Fire Alarm Strobe, (w) is Candela Rating
[ISD]	New Intelligent Photoelectric Smoke Detector
[ISD]	New Intelligent Photoelectric Duct Smoke Detector
[MM]	New Monitor Module
[CM]	New Control Module
[DM]	Existing Magnetic Door Holder
[ES]	Existing Electric Door Strike
[SSS]	Existing Fire Suppression System
[R]	New Fan Shutdown Relay
[SD]	New Smoke Damper
[RTS/]	Remote Test Switch W/Indicator



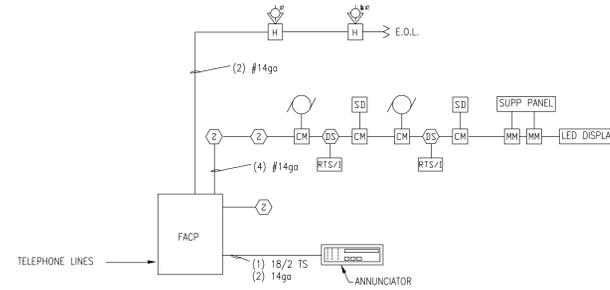
DETAIL ILLUSTRATING NEW SURFACE MOUNTED PULL STATION
NOT TO SCALE



DETAIL ILLUSTRATING NEW SURFACE MOUNTED NOTIFICATION APPLIANCE
NOT TO SCALE

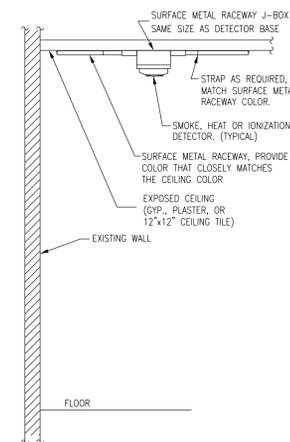


- NOTES:
1. WIRE INTO HVAC CONTROL PANEL OR STARTER TO SHUT DOWN AIR HANDLER IN THE EVENT SMOKE IS DETECTED. PROVIDE OVERRIDE SWITCH (KEYED SWITCH OR START PUSH-BUTTON STATION IN LOCKED ENCLOSURE) ADJACENT TO FACP TO RESTART THE HVAC UNIT. PROVIDE WRITTEN STATEMENT TO DSF CONSTR. REP. THAT THE SYSTEM WAS TESTED AND OPERATES CORRECTLY.
 2. MOUNT REMOTE TEST STATION ON NEAREST WALL THAT PROVIDES ACCESS. IN INSTALLATIONS WHERE TWO OR MORE AHU'S ARE INSTALLED TOGETHER, MOUNT ALL TEST SWITCHES IN ONE AREA.
 3. DUCT SMOKE DETECTORS SHALL BE INSTALLED IN RETURN AIR SYSTEMS WITH A CAPACITY GREATER THAN 2,000 CFM, IN THE RETURN AIR DUCT OR PLENUM UPSTREAM OF ANY FILTERS, EXHAUST AIR CONNECTIONS, OUTDOOR AIR CONNECTIONS, OR DECONTAMINATION EQUIPMENT AND APPLIANCES.
 4. NOT USED.
 5. NOT USED.
 6. THE ACTUATION OF A DUCT SMOKE DETECTOR SHALL ACTIVATE A VISIBLE AND AUDIBLE SUPERVISORY SIGNAL AT A CONSTANTLY ATTENDED LOCATION (HOWARD PLANT CONTROL ROOM).

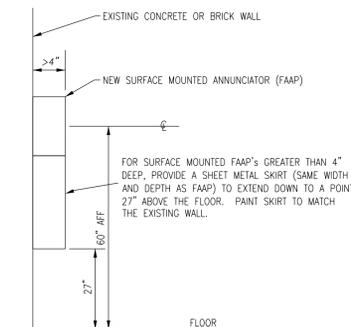


- NOTES:
- ALL EQUIPMENT SHOWN ON THIS RISER MAY NOT APPLY. SEE FLOOR PLANS AND SPECIFICATIONS FOR ACTUAL DEVICES AND EQUIPMENT REQUIRED.
1. E.O.L. = END OF LINE RESISTOR
 2. MOUNT ANNUNCIATOR 60" AFF TO CENTER.
 3. R.A. = RETURN AIR

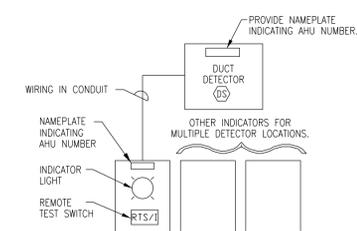
TYPICAL ADDRESSABLE FIRE ALARM SYSTEM RISER
NOT TO SCALE



DETAIL ILLUSTRATING NEW SURFACE MOUNTED AUTOMATIC DETECTOR IN FINISHED AREAS
NOT TO SCALE



SERVICE ANNUNCIATOR MOUNTING DETAIL
NOT TO SCALE



AIR HANDLING SHUTDOWN DETAIL
NOT TO SCALE

NO.	BY	REVISION	DATE

Milwaukee Water Works		Water Engineering	
Department of Public Works		Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
SITE PLAN - FIRE ALARM			
DESIGNED BY	A.A.	DATE	9-25-12
DRAWN BY	S. MILLER	PLANT'S PROJECT ENGINEER	
CHECKED BY	A.J.S.	DATE	9-25-12
DATE	5-8-2012	CHIEF DESIGN ENGINEER	
SCALE	AS SHOWN	DATE	9-25-12
WORK ORDER	WT450093300	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
OFFICIAL NOTICE	56-2012	FILE NO.	B-12-2
DRAWING NO.			HP-179-20

ABBREVIATIONS:

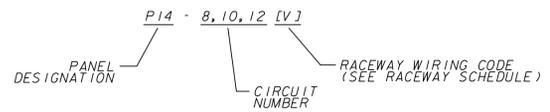
1P	ONE POLE
2P	TWO POLE
3P	THREE POLE
4P	FOUR POLE
1P/1W	ONE POLE, ONE WIRE
1P/2W	ONE POLE, TWO WIRE
2P/2W	TWO POLE, TWO WIRE
2P/3W	TWO POLE, THREE WIRE
3P/2W	THREE POLE, TWO WIRE
3P/3W	THREE POLE, THREE WIRE
3P/4W	THREE POLE, FOUR WIRE
4P/4W	FOUR POLE, FOUR WIRE
A	AMPERE
AC	ALTERNATING CURRENT
AF	AMP FRAME
AFB	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPTING CAPACITY
AL	ALUMINUM
AS	AMP SWITCH
AT	AMP TRIP
ARCH	ARCHITECT
ATS	AUTOMATIC TRANSFER SWITCH
A/V	AUDIO VISUAL
B	BELOW FINISHED FLOOR
BF	BELOW FINISHED GRADE
BLDG	BUILDING
C	CONDUIT
CAT	CATALOG
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLG	CEILING MOUNTED
CT	CURRENT TRANSFORMER
CU	COPPER
CL	CENTERLINE
D	DEDICATED DEVICE
DC	DIRECT CURRENT
Δ	DELTA
DISC	DISCONNECT
DWG	DRAWING
E	EMERGENCY
EC	ELECTRICAL CONTRACTOR
EMT	ELECTRIC METALLIC TUBING
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EX	EXISTING
FLA	FULL LOAD AMPS
GC	GENERAL CONTRACTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFPE	GROUND FAULT PROTECTION EQUIPMENT
GND	GROUND
GRC	GALVANIZED RIGID CONDUIT
HP	HORSEPOWER
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HZ	HERTZ (cycle) PER SECOND
JB	JUNCTION BOX
KVA	KILOVOLT AMPERE
KVAR	KILOVOLT AMPERE REACTIVE
KW	KILOWATT
LP	LIGHTING PANELBOARD
LS	LIMIT SWITCH
LTG	LIGHTING
LV	LOW VOLTAGE
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH
NA	NOT APPLICABLE
NCC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NUMBER NOT TO SCALE
P	POLE
PB	PULL BOX
PC	PLUMBING SYSTEM CONTRACTOR
PH	PHASE
PNL	PANEL (BOARD)
PP	POWER PANEL
PR	PAIR
PR1	PRIMARY
PVC	POLYVINYL CHLORIDE CONDUIT
RSC	RECESSED
SEC	RIGID STEEL CONDUIT
SN	SECONDARY
SP	SOLID NEUTRAL
SS	SPARE
SS	STAINLESS STEEL
ST	SHUNT TRIP
STP	SHIELDED TWISTED PAIR
SUSP	SUSPENDED
SW	SWITCH
SWBD	SWITCHBOARD
T	TAMPER RESISTANT SAFETY RECEPTACLE
T&B	TOP AND BOTTOM
TC	TELEPHONE CABINET
TCI	TELECOMMUNICATIONS CABLING INSTALLER
TEL/DATA	TELEPHONE/DATA
TEL	TELEPHONE
TYP	TYPICAL
UG	UNDERGROUND
UTP	UNSHIELDED TWISTED PAIR
V	VOLT
UOI	UNLESS OTHERWISE INDICATED
W	WATT
WP	WEATHERPROOF
XFMR	TRANSFORMER
ZAM	ZONE ADAPTER MODULE

SYMBOLS:

	INTERRUPTER SWITCH WITH FUSES
	FUSED VOLTAGE TRANSFORMER
	CURRENT TRANSFORMERS
	VOLTAGE SENSOR
	SWITCH OPERATOR
	SOURCE TRANSFER CONTROLLER
	SURGE ARRESTERS
	GENERATOR
	GROUND CONNECTION - SYSTEM AND OR EQUIPMENT
	CIRCUIT BREAKER (OPEN) (xxAF) FRAME SIZE (yyAT) TRIP SIZE (3P) NUMBER OF POLES
	DUPLEX RECEPTACLE - MOUNTED 18" AFF UNLESS OTHERWISE NOTED CIRCUIT NUMBER (SEE PLAN FOR PANEL BOUNDARIES) - TYPICAL RECEPTACLE TYPE (D) DEDICATED CIRCUIT (DD) DOUBLE DUPLEX (GFCI) GROUND FAULT CIRCUIT INTERRUPTING (WP) WEATHERPROOF
	TLPIA xxx KVA xxx V, x PH, x W PRI xxx Y/xxx V, x PH, x W SEC TRANSFORMER, DRY TYPE, UNLESS OTHERWISE INDICATED. (TLPIA) TRANSFORMER IDENTIFICATION
	POTENTIAL TRANSFORMER (3) QUANTITY
	CURRENT TRANSFORMER (3) QUANTITY (400-5A) RATIO
	PANELBOARD

	DATA OUTLET
	TELEPHONE/DATA OUTLET
	TELEPHONE OUTLET
	TIME CLOCK - SEE SCHEDULE
	CONTRACTOR - SEE SCHEDULE
	PHOTO CELL
	WALL MOUNTED LIGHT FIXTURES
	POLE MOUNTED LIGHT FIXTURES WITH ARM
	POST TOP MOUNTED LIGHT FIXTURES
	EXIT LAMP
	RECESSED DOWNLIGHT
	SURFACE MOUNTED CEILING FIXTURE
	RECESSED FLOURESCENT FIXTURE
	NON-SWITCHED LUMINAIRE
	SUSPENDED FLOURESCENT TROFFER
	SURFACE MOUNTED STRIPLIGHT
	WALL MOUNTED STRIPLIGHT
	SPECIAL POWER RECEPTACLE - NUMBER INDICATES NEMA CONFIGURATION SEE PLANS
	PUSHBUTTON
	SPECIAL PURPOSE OUTLET
	SPECIAL PURPOSE OUTLET - (SEE SCHEDULE) (1) DEVICE IDENTIFICATION
	MOTOR CONNECTION - (SEE SCHEDULE) (X) MOTOR IDENTIFICATION
	MOTOR, SQUIRREL CAGE INDUCTION, HORSEPOWER INDICATED
	PANELBOARD - SURFACE MOUNTED (SEE SCHEDULE)
	TRANSFORMER - PAD MOUNTED
	METER
	COMBINATION MOTOR STARTER INDICATES MOTOR STARTER CONTROLS (SEE SCHEDULE)
	JUNCTION BOX
	DISCONNECT SWITCH INDICATES MOTOR DISCONNECT SWITCH FEEDS
	SHUNT TRIP
	KIRK KEY INTERLOCK SYSTEM (2) RELATED KIRK KEYS
	SWITCH M - MANUAL MOTOR STARTER 2 - 2 POLE 3 - 3 POLE
	THERMOMETER

	OCCUPANCY SENSOR X - FLOOR LOCATION Y - NUMBERED SEQUENTIALLY
	DISCONNECT SWITCH, NONFUSED, SIZE AS INDICATED ON DRAWING (xxI) AMPERAGE RATING
	DISCONNECT SWITCH, FUSED TYPE, SIZE AS INDICATED ON DRAWING (xxAF) FRAME SIZE (xxAT) FUSE SIZE, DUAL ELEMENT
	DISCONNECT SWITCH, CIRCUIT BREAKER TYPE, SIZE AS INDICATED ON DRAWING (xxAF) FRAME SIZE (xxAT) TRIP SIZE
	VARIABLE FREQUENCY DRIVE INDICATES MOTOR CONTROLLED
	COMBINATION MAGNETIC STARTER AND DISCONNECT (F) FUSED DISCONNECT SWITCH (CB) CIRCUIT BREAKER (NEMA) NEMA STARTER SIZE (xxA) FUSE OR CIRCUIT BREAKER RATING (XP) NUMBER POLES INDICATES MOTOR CONTROLLED
	LOW VOLTAGE DRAW OUT TYPE CIRCUIT BREAKER (xxA) TRIP SIZE (yyP) NUMBER OF POLES
	CONTACT, NORMALLY OPEN (NO) ('TC' - WITH TIMED CLOSING)
	CONTACT, NORMALLY CLOSED (TO) ('TO' - WITH TIMED OPENING)
	DISCONNECT SWITCH UNFUSED (xxAF) FRAME SIZE
	FUSE (ZZA) FUSE RATING
	INDICATES DEMOLITION WORK OR EQUIPMENT



NO.	BY	REVISION	DATE

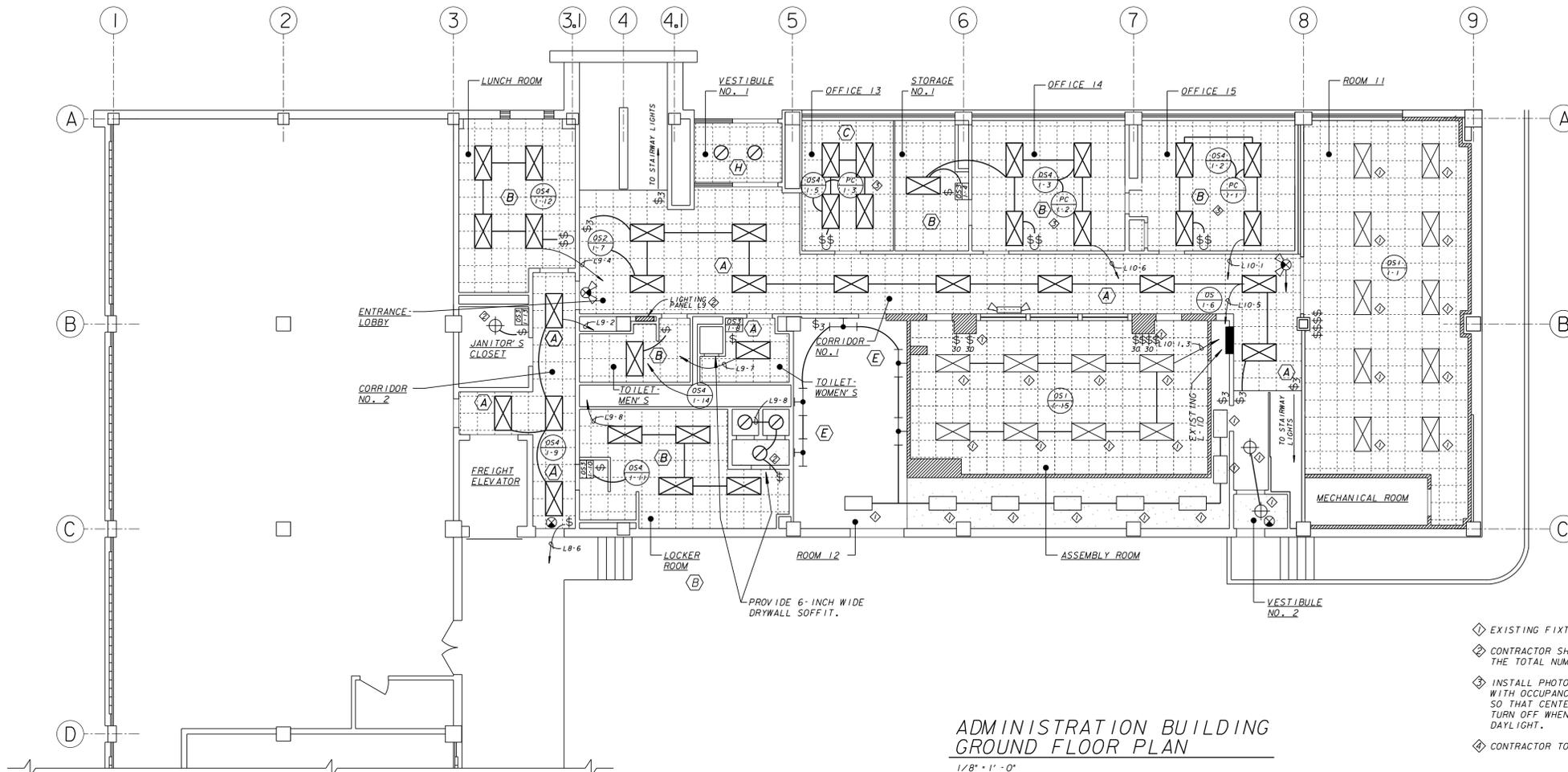
Milwaukee Water Engineering
Department of Public Works

HOWARD AVENUE PURIFICATION PLANT

ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS
HP-179

SYMBOLS & ABBREVIATIONS - ELEC./LIGHT.

DESIGNED BY	DATE
DRAWN BY S. MILLER	9-25-12
CHECKED BY	PLANT'S PROJECT ENGINEER
DATE 6-21-2012	9-25-12
SCALE AS SHOWN	CHIEF DESIGN ENGINEER
WORK ORDER WT450093300	9-25-12
OFFICIAL NOTICE 56-2012	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS
FILE NO. 8-12-2	DRAWING NO. HP-179-21



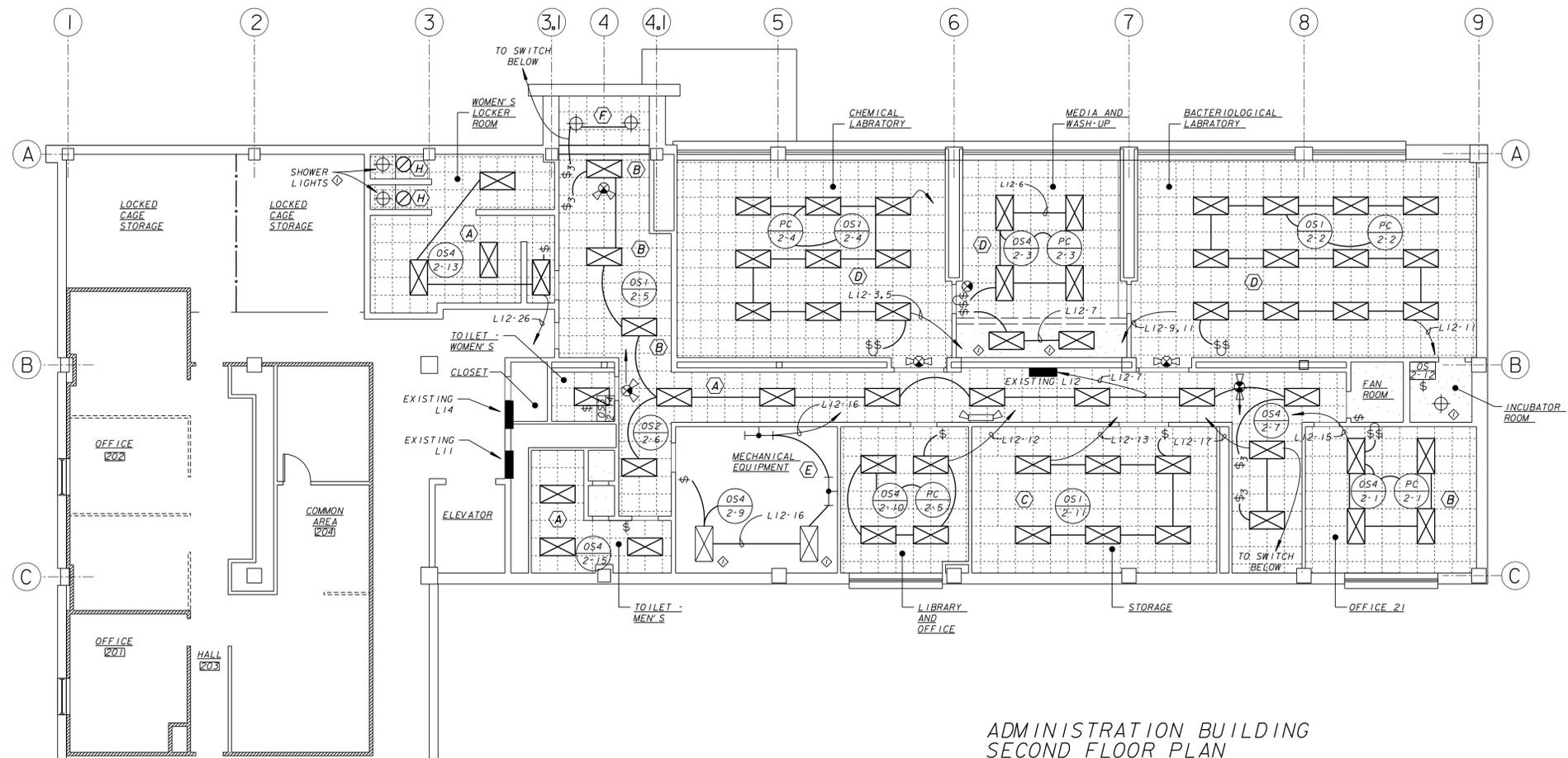
ADMINISTRATION BUILDING
GROUND FLOOR PLAN
1/8" = 1' - 0"

- NOTES:
- ◇ EXISTING FIXTURE, WIRING AND CONTROLS TO REMAIN.
 - ◇ CONTRACTOR SHALL BE RESPONSIBLE FOR CALCULATING THE TOTAL NUMBER OF POWER PACKS NEEDED.
 - ◇ INSTALL PHOTOCELL AND ADDITIONAL POWER PACK ALONG WITH OCCUPANCY SENSOR. PHOTOCELL SHALL BE INSTALLED SO THAT CENTER LIGHTS OF LUMINAIRES IN DAYLIGHT ZONE TURN OFF WHEN ROOM IS OCCUPIED AND THERE IS SUFFICIENT DAYLIGHT.
 - ◇ CONTRACTOR TO REUSE EXISTING SWITCHES AS APPLICABLE.

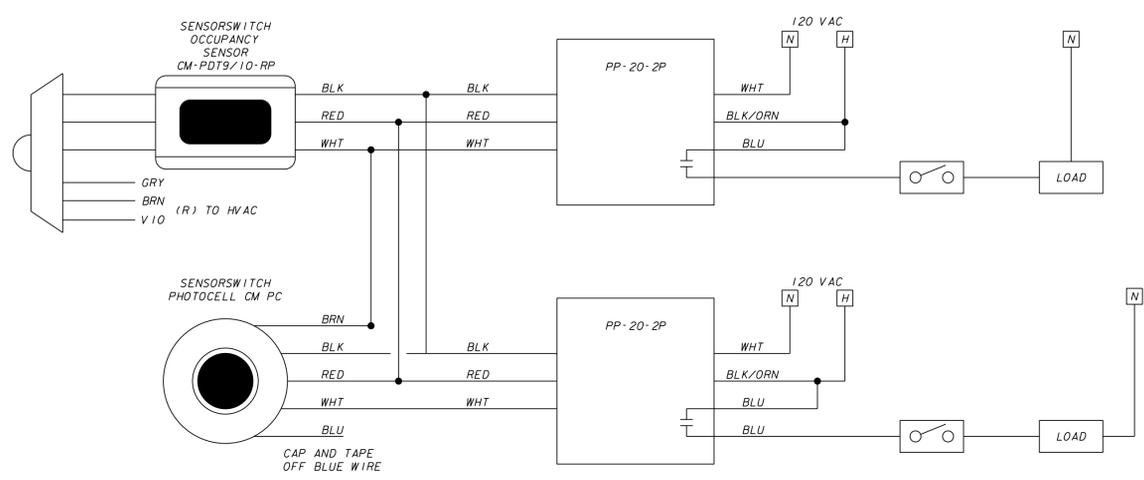
NOTES:
1 ALL EXIT LIGHTS ARE FED FROM PANEL L1 CIRCUIT 35

Milwaukee Water Works Department of Public Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
GROUND FLOOR PAN - LIGHTING			
DESIGNED BY	M.A.G.	APPROVED	DATE
DRAWN BY	J.F.S.	<i>Andrew Reynolds</i>	9-25-12
CHECKED BY	A.J.S.	<i>Daniel G. Hart</i>	PLANT PROJECT ENGINEER
DATE	4-25-12	<i>William</i>	9-25-12
SCALE	AS SHOWN		CHIEF DESIGN ENGINEER
WORK ORDER	WT450093300		9-25-12
OFFICIAL NOTICE	56-2012		SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS
FILE NO.	B-12-2	DRAWING NO. HP-179-22	

NO.	BY	REVISION	DATE



ADMINISTRATION BUILDING
SECOND FLOOR PLAN
1/8" = 1' - 0"



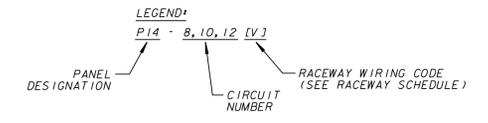
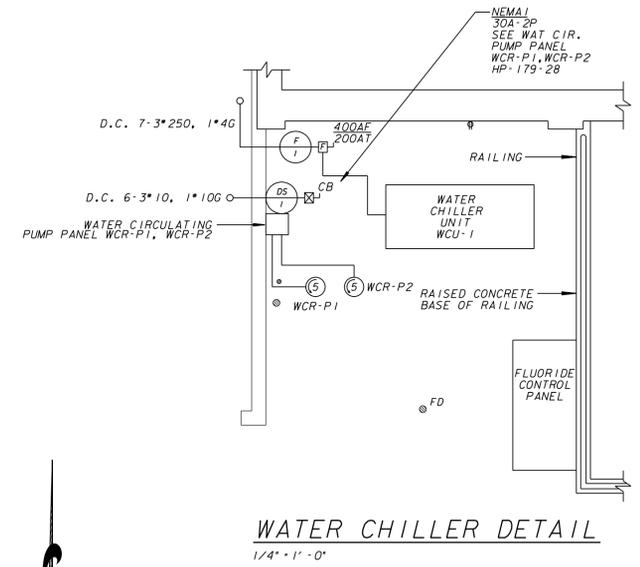
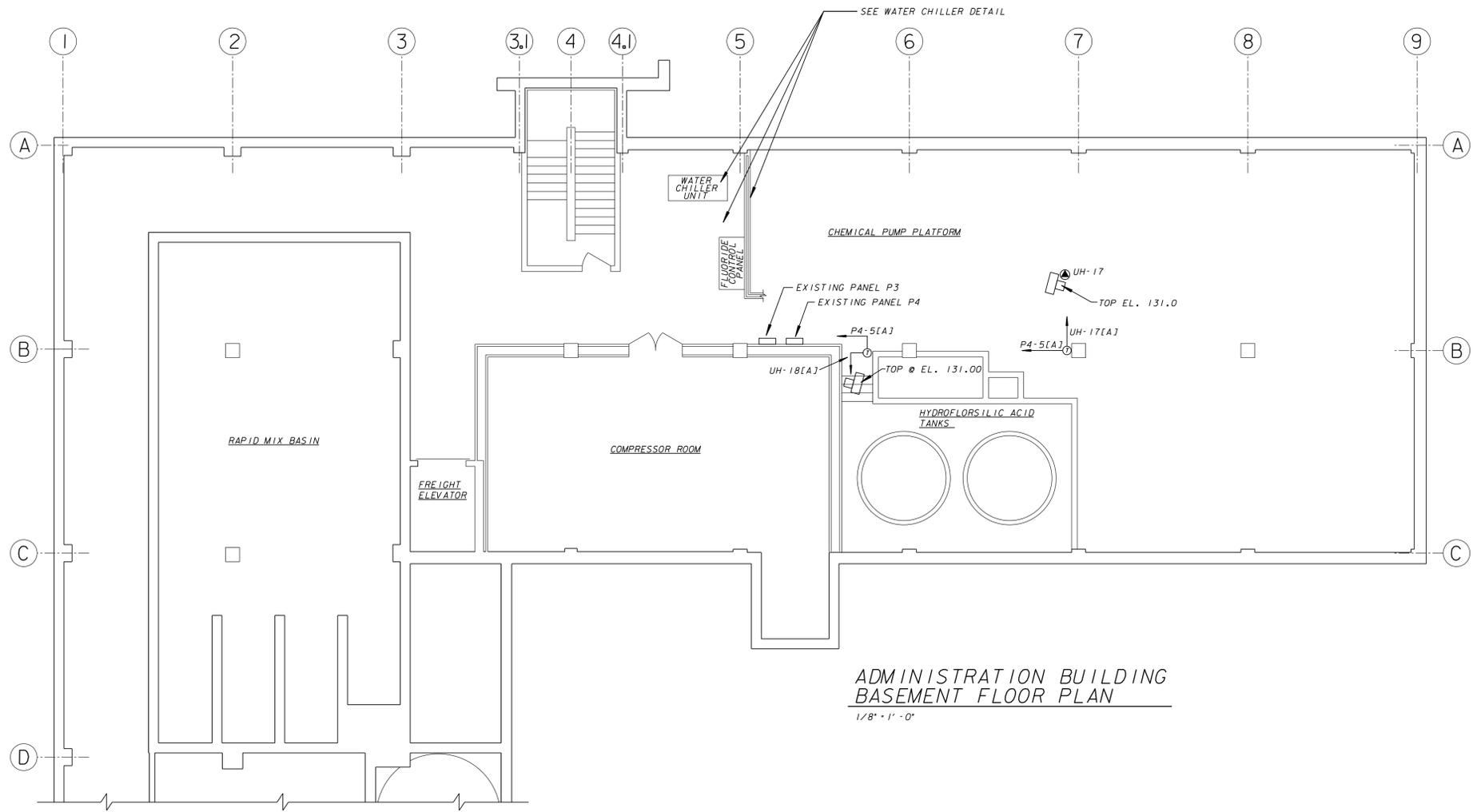
OCCUPANCY SENSOR AND PHOTOCELL
CONTROLLING TWO LOADS
N.T.S.

- ◊ EXISTING FIXTURE, WIRING AND CONTROLS TO REMAIN.
- ◊ CONTRACTOR SHALL BE RESPONSIBLE FOR CALCULATING THE TOTAL NUMBER OF POWER PACKS NEEDED.
- ◊ INSTALL PHOTOCELL AND ADDITIONAL POWER PACK ALONG WITH OCCUPANCY SENSOR. PHOTOCELL SHALL BE INSTALLED SO THAT CENTER LIGHTS OF LUMINAIRES IN DAYLIGHT ZONE TURN OFF WHEN ROOM IS OCCUPIED AND THERE IS SUFFICIENT DAYLIGHT.
- ◊ CONTRACTOR TO REUSE EXISTING SWITCHES AS APPLICABLE.

Milwaukee Water Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
SECOND FLOOR PLAN - LIGHTING			
DESIGNED BY	M.A.G.	PROVED	DATE
DRAWN BY	J.F.S.	<i>Andrew Reynolds</i>	9-25-12
CHECKED BY	A.J.S.	<i>Daniel J. Hart</i>	PLANT'S PROJECT ENGINEER
DATE	4-25-12	<i>William</i>	9-25-12
SCALE	AS SHOWN		CHIEF DESIGN ENGINEER
WORK ORDER	WT450093300		9-25-12
OFFICIAL NOTICE	56-2012		SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS
FILE NO.	B-12-2		

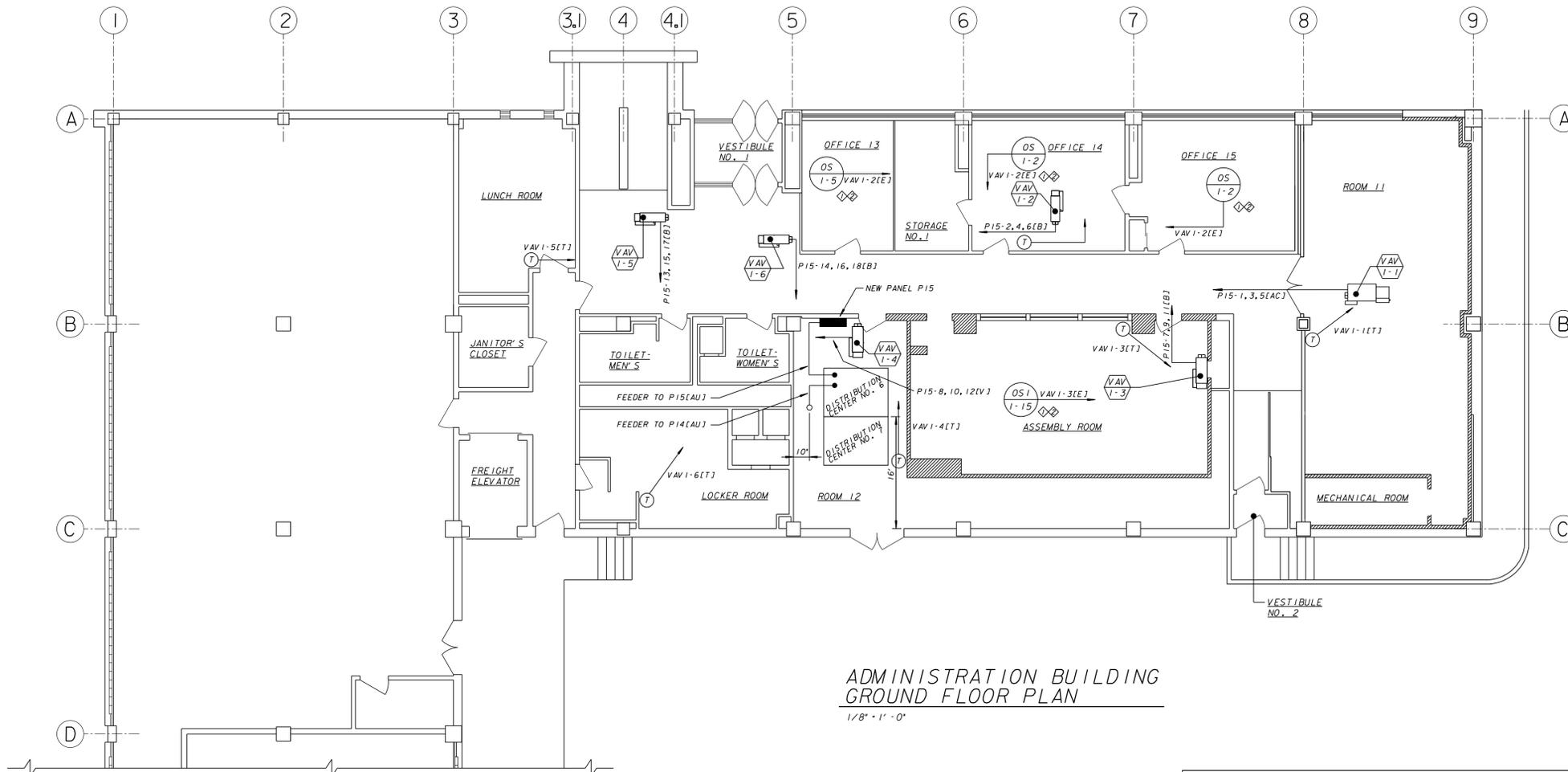
NO.	BY	REVISION	DATE

DRAWING NO. **HP-179-23**



Milwaukee Water Works		Water Engineering	
Department of Public Works		Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
BASEMENT FLOOR PLAN - ELECTRICAL			
DESIGNED BY	M.A.G.	APPROVED	DATE
DRAWN BY	J.F.S.	<i>Andrew Reynolds</i>	9-25-12
CHECKED BY	A.J.S.	<i>James J. Smith</i>	PLANT PROJECT ENGINEER
DATE	4-25-12	<i>William J. Sullivan</i>	9-25-12
SCALE	AS SHOWN	<i>William J. Sullivan</i>	CHIEF DESIGN ENGINEER
WORK ORDER	WT450093300		9-25-12
OFFICIAL NOTICE	56-2012		SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS
FILE NO.	B-12-2	DRAWING NO. HP-179-24	

NO.	BY	REVISION	DATE



ADMINISTRATION BUILDING
GROUND FLOOR PLAN
1/8" = 1' - 0"

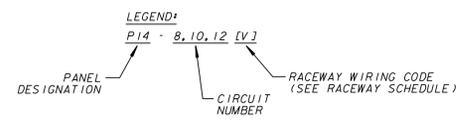
PANEL SCHEDULE P15 (GROUND FLOOR)

VOLTAGE 120/208 VOLTS
3 PHASE, 4 WIRE
MOUNTING: WALL
22,000 AMPS 1C
BOLT-ON BREAKERS

ENCLOSURE: NEMA 1
MAIN: 200 AMPS
NEUTRAL: FULL
TYPE: MAIN BREAKER
LOCATION: CHEM. BLDG.
GROUND FLOOR

DESCRIPTION	VA/ PHASE	BKR. SIZE	BKR. POLES	CKT. NO.	THREE PHASE	CKT. NO.	BKR. POLES	BKR. SIZE	VA/ PHASE	DESCRIPTION
VAV-1-1	2660.05	30	3	1		2		15	1167.26	VAV-1-2
VAV-1-1	2660.05			3		4			1167.26	VAV-1-2
VAV-1-1	2660.05			5		6			1167.26	VAV-1-2
VAV-1-3	833.42	15		7		8		20	1833.75	VAV-1-4
VAV-1-3	833.42			9		10			1833.75	VAV-1-4
VAV-1-3	833.42			11		12			1833.75	VAV-1-4
VAV-1-5	666.50	15		13		14		15	1167.26	VAV-1-6
VAV-1-5	666.50			15		16			1167.26	VAV-1-6
VAV-1-5	666.50			17		18			1167.26	VAV-1-6
				19		20				
				21		22				
				23		24				
				25		26				
				27		28				
				29		30				
				31		32				
				33		34				
				35		36				
				37		38				
				39		40				
				41		42				

24,984.72 TOTAL VA
69.35 TOTAL AMPS



- NOTES:**
- MULTIPLE OCCUPANCY SENSOR OUTPUTS TO SAME VAV BOX SHALL BE PARALLELED
 - CONTRACTOR TO FURNISH AND INSTALL TWO (2) 200A, CIRCUIT BREAKERS IN DISTRIBUTION CENTER NO. 6. CIRCUIT BREAKERS SHALL BE THERMAL MAGNETIC, RATED 22,000 AIC, 240VAC 3-PHASE AS MANUFACTURED BY KINNEY ELECTRICAL MANUFACTURING, INC.

Milwaukee Water Engineering
Department of Public Works

HOWARD AVENUE PURIFICATION PLANT

ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS
HP-179

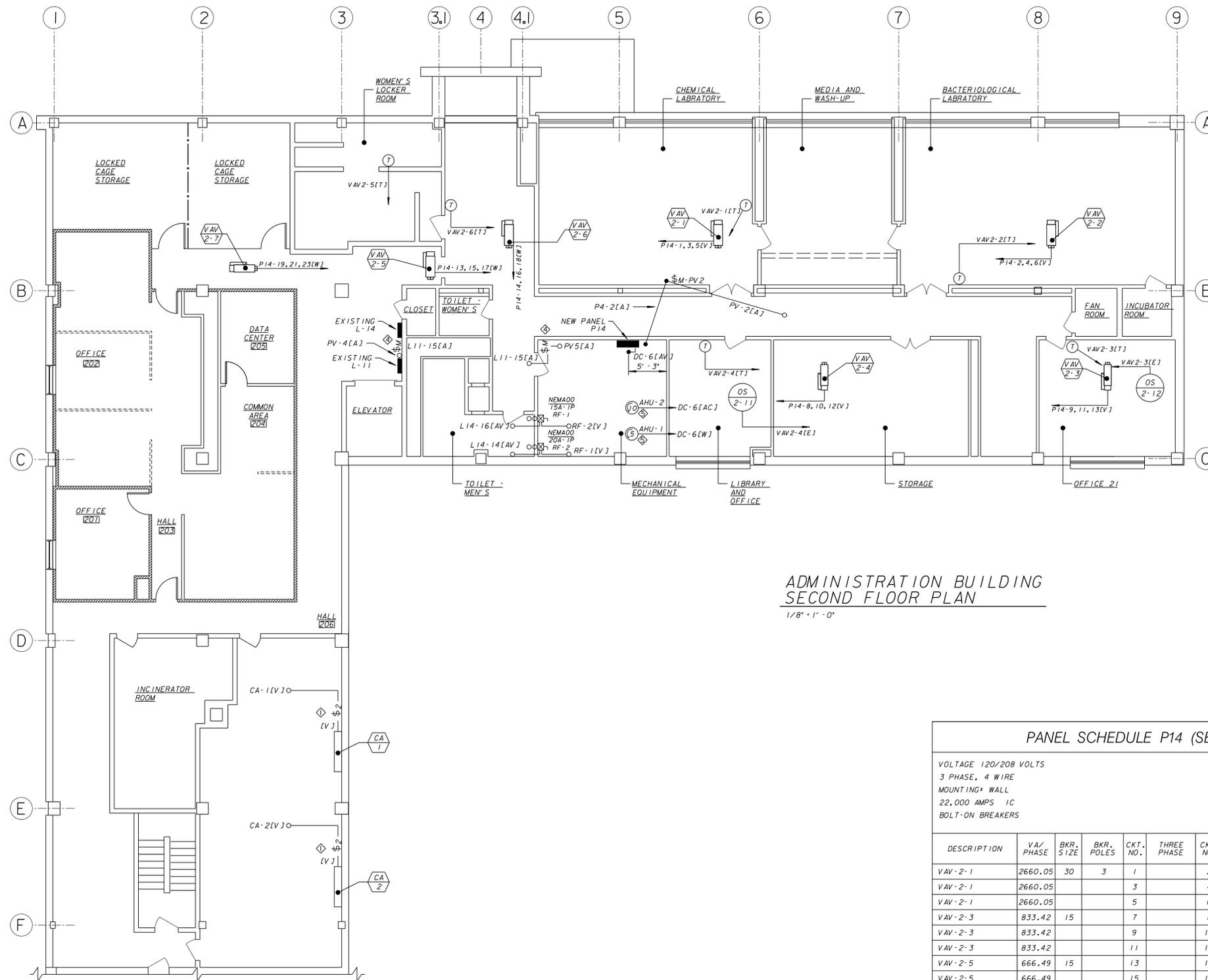
GROUND FLOOR PLAN - ELECTRICAL

DESIGNED BY	S. MILLER	DATE	9-25-12
DRAWN BY	A.A.	PLANT'S PROJECT ENGINEER	
CHECKED BY	A.A.	DATE	5-14-2012
DATE	5-14-2012	CHIEF DESIGN ENGINEER	
SCALE	AS SHOWN		
WORK ORDER	WT450093300		
OFFICIAL NOTICE	56-2012		
FILE NO.	B-12-2		

APPROVED: *[Signature]* SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS

DRAWING NO. **HP-179-25**

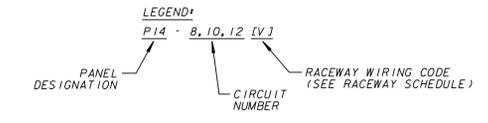
NO.	BY	REVISION	DATE



ADMINISTRATION BUILDING
SECOND FLOOR PLAN
1/8" = 1' - 0"

PANEL SCHEDULE P14 (SECOND FLOOR)										
VOLTAGE 120/208 VOLTS 3 PHASE, 4 WIRE MOUNTING* WALL 22,000 AMPS 1C BOLT-ON BREAKERS						ENCLOSURE* NEMA 1 MAIN* 200 AMPS NEUTRAL* FULL TYPE* MAIN BREAKER LOCATION* CHEM. BLDG. SECOND FLOOR				
DESCRIPTION	VAV/ PHASE	BKR. SIZE	BKR. POLES	CKT. NO.	THREE PHASE	CKT. NO.	BKR. POLES	BKR. SIZE	VAV/ PHASE	DESCRIPTION
VAV-2-1	2660.05	30	3	1		2		15	1167.26	VAV-2-2
VAV-2-1	2660.05			3		4			1167.26	VAV-2-2
VAV-2-1	2660.05			5		6			1167.26	VAV-2-2
VAV-2-3	833.42	15		7		8		20	1833.75	VAV-2-4
VAV-2-3	833.42			9		10			1833.75	VAV-2-4
VAV-2-3	833.42			11		12			1833.75	VAV-2-4
VAV-2-5	666.49	15		13		14		15	1167.26	VAV-2-6
VAV-2-5	666.49			15		16			1167.26	VAV-2-6
VAV-2-5	666.49			17		18			1167.26	VAV-2-6
VAV-2-7	3338.47	40		19		20				
VAV-2-7	3338.47			21		22				
VAV-2-7	3338.47			23		24				
				25		26				
				27		28				
				29		30				
				31		32				
				33		34				
				35		36				
				37		38				
				39		40				
				41		42				

35,000.10 TOTAL VA
97.15 TOTAL AMPS



- NOTES:
- ◆ FURNISH AND INSTALL BRYANT 3002PLR277 TOGGLE SWITCH DPDT, 30 A., 120/277 VAC, WITH IVORY NAMEPLATE IN SWITCHBOARD
 - ◆ EQUIPMENT FURNISHED AND INSTALLED BY OTHERS
 - ◆ REUSE EXISTING CONDUIT WHERE CONVENIENT
 - ◆ FURNISH AND INSTALL CLASS 2510 TYPE F, MANUAL MOTOR STARTER WITH MELTING ALLOY TYPE THERMAL OVERLOAD RELAY, RED PILOT LIGHT, 115 VAC, 1P, 1 HP
 - ◆ CIRCUIT BREAKER DISCONNECT FURNISHED BY MANUFACTURER INTEGRAL TO UNIT

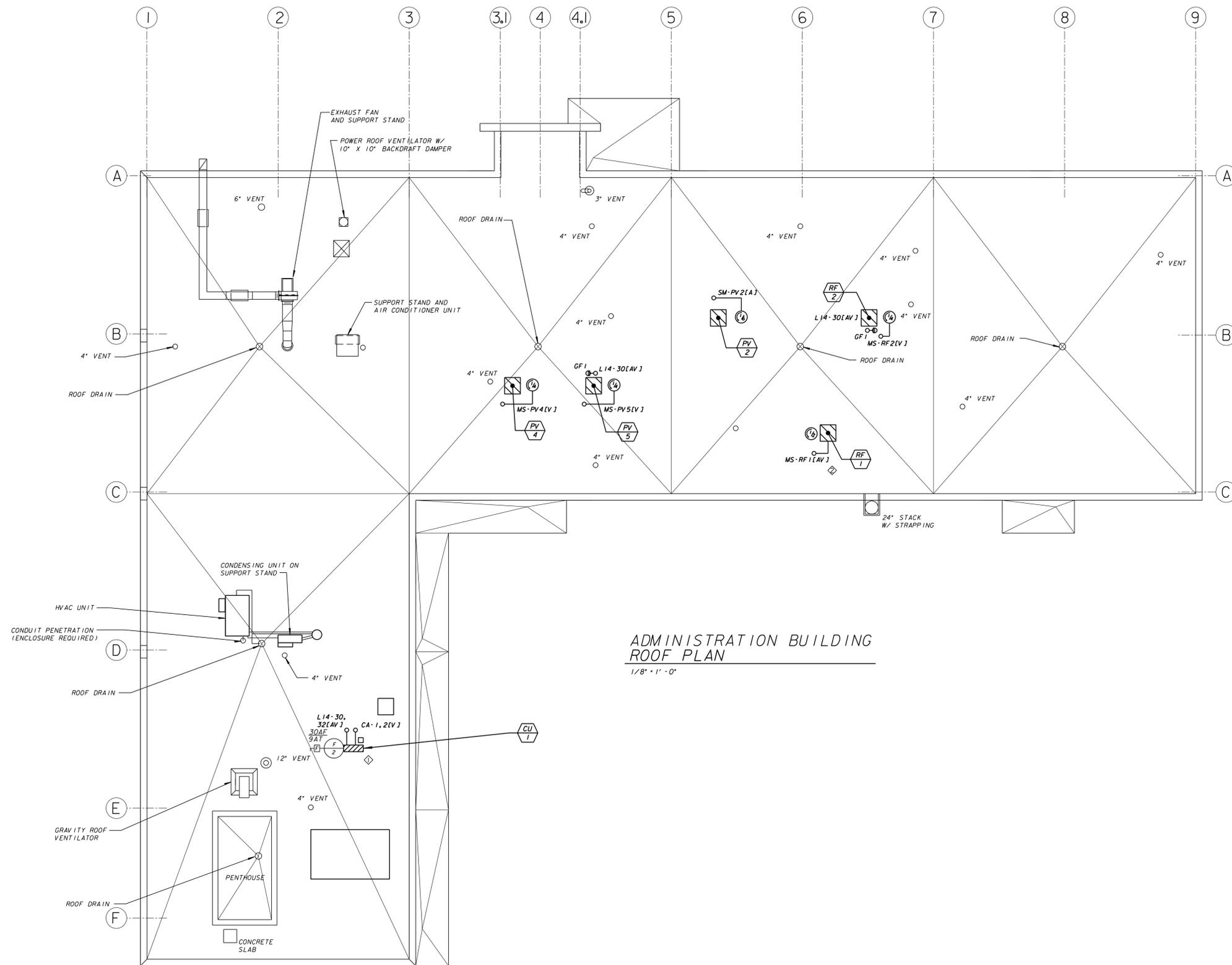
Milwaukee Water Engineering
Department of Public Works

HOWARD AVENUE PURIFICATION PLANT
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS
HP-179
SECOND FLOOR PLAN - ELECTRICAL

DESIGNED BY	S. MILLER	DATE	9-25-12
DRAWN BY	A.A.	PLANT PROJECT ENGINEER	
CHECKED BY	A.A.	PLANT PROJECT ENGINEER	
DATE	5-23-2012	CHIEF DESIGN ENGINEER	9-25-12
SCALE	AS SHOWN	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	9-25-12
WORK ORDER	WT450093300		
OFFICIAL NOTICE	56-2012		
FILE NO.	B-12-2		

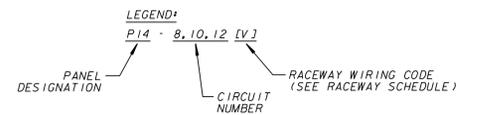
DRAWING NO. **HP-179-26**

NO.	BY	REVISION	DATE



ADMINISTRATION BUILDING
ROOF PLAN

1/8" = 1' - 0"

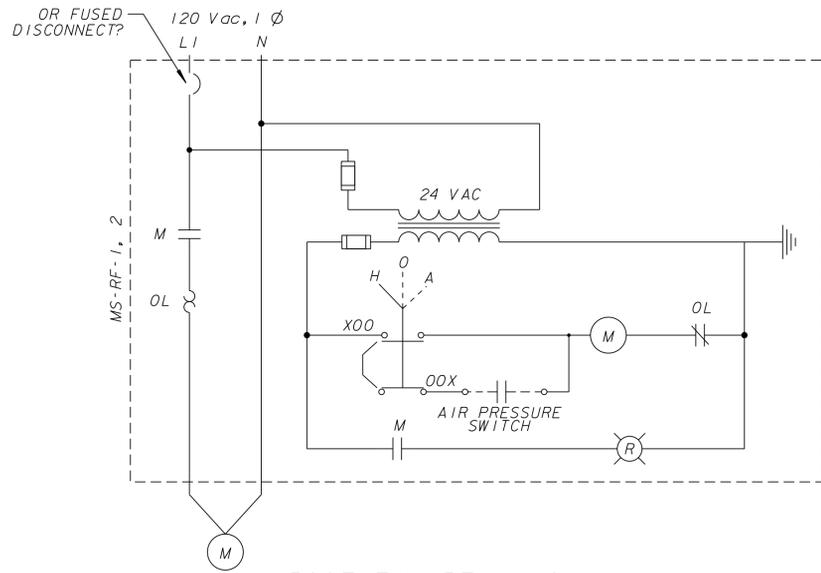


NOTES:

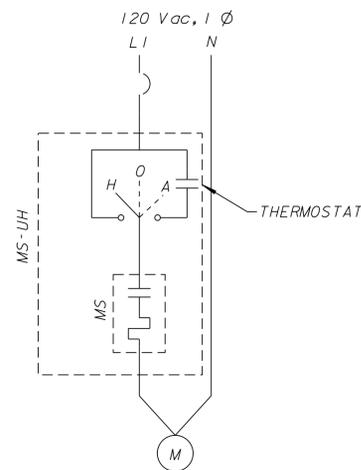
- ◇ CONTRACTOR TO SEAL ALL ROOF PENETRATIONS USING PITCH POCKETS AND NON-SHRINK GROUT
- ◇ DISCONNECT FURNISHED BY MANUFACTURER - INTEGRAL TO UNIT

Milwaukee Water Works		Water Engineering Department of Public Works	
HOWARD AVENUE PURIFICATION PLANT			
ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS			
HP-179			
ROOF PLAN - ELECTRICAL			
DESIGNED BY	M.A.G.	APPROVED	DATE
DRAWN BY	J.F.S.	<i>Andrew Reynolds</i>	9-25-12
CHECKED BY	A.J.S.	<i>James G. Smith</i>	PLANT PROJECT ENGINEER
DATE	4-25-12	<i>William</i>	9-25-12
SCALE	AS SHOWN	<i>William</i>	CHIEF DESIGN ENGINEER
WORK ORDER	WT450093300	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
OFFICIAL NOTICE	56-2012	DRAWING NO. HP-179-27	
FILE NO.	B-12-2		

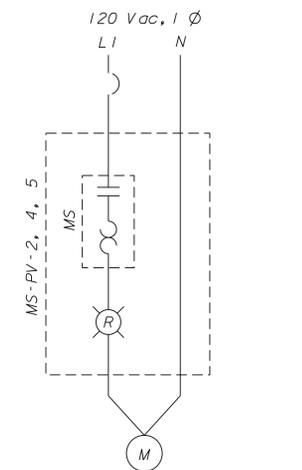
NO.	BY	REVISION	DATE



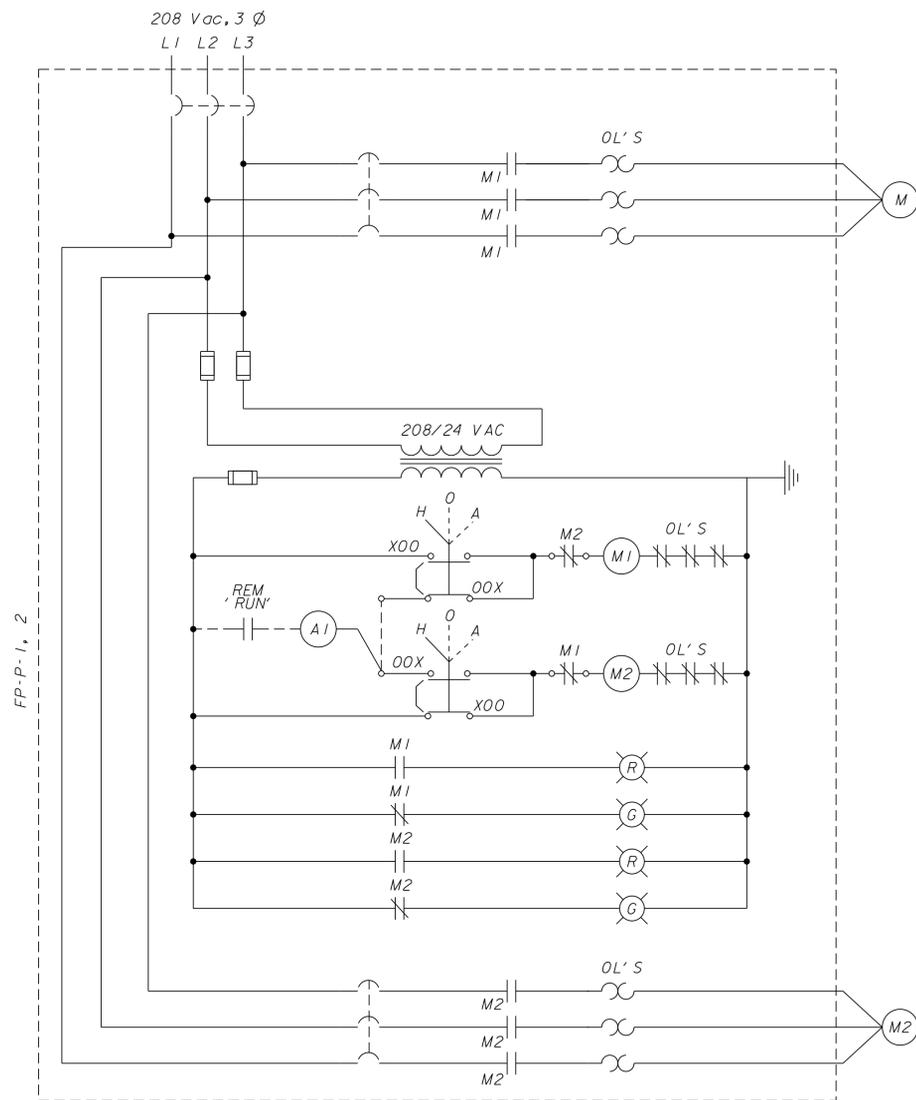
ROOF FAN RF-1, 2



UNIT HEATERS



POWER VENTILATORS
PV-2, 4, 5



WATER CIRCULATING PUMP PANEL
WCR-P1, WCR-P2

NOTES:

- PROVIDE MANUAL STARTER INCLUDING RED PILOT LIGHT AND LOCKABLE HANDLE GUARD FOR PV-2, 4 AND 5

Milwaukee Water Works Water Engineering
 Department of Public Works
HOWARD AVENUE PURIFICATION PLANT
 ADMINISTRATION BUILDING HVAC & LIGHTING IMPROVEMENTS
 HP-179
 ELECTRICAL SCHEMATICS

DESIGNED BY	B.S.T.	APPROVED	DATE
DRAWN BY	S. MILLER	<i>Andrew Reynolds</i>	9-25-12
CHECKED BY	A.A.	<i>James G. Hart</i>	9-25-12
DATE	6-11-2012	<i>Andrew Reynolds</i>	9-25-12
SCALE	NONE	<i>Andrew Reynolds</i>	9-25-12
WORK ORDER	WT450093300	SPECIAL DEPUTY COMMISSIONER OF PUBLIC WORKS	
OFFICIAL NOTICE	56-2012		
FILE NO.	B-12-2	DRAWING NO. HP-179-28	

NO.	BY	REVISION	DATE

